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EDITORIAL.

ANTI-TUBERCULOSIS TEACHING.

CONSIDERABLE enterprise and ingenuity has been displayed in this and other lands, and particularly by enthusiasts in the United States of America, whereby the unthinking public has been instructed in the first principles and fundamental practices of anti-tuberculosis hygiene.

The day is past when philanthropic effort remained content with the application merely of palliative measures for the tuberculous sick. No longer does humanitarian zeal rest satisfied with the erection and maintenance of sanatoria and hospitals for those who have succumbed to tuberculosis. The disease is now rightly viewed as preventable, and nothing short of prevention will stay the demands of the reforming hygienist.

Much can and has been accomplished by collective action, through wisely-directed State and Municipal endeavour, and organized effort of many kinds, to reduce the power of the tuberculous destroyer and to limit the area of his devastation. Still more will be accomplished when we have learned the wisdom, and secured the means, whereby co-ordination and co-operation of forces may be attained. But progress must inevitably be limited until the conscience and intelligence of every citizen is aroused to the necessity of recognizing that the adoption of anti-tuberculosis measures must be viewed as a duty, and form a part of personal hygiene. The prevention of tuberculosis is a matter for the individual as well as a problem for the State.

Of recent years the medical profession has wisely, and rightly, agitated for the provision of adequate teaching in every elementary school regarding the principles of hygiene and temperance ; and the

issue by the English Board of Education of the admirable "Syllabus of Lessons on Temperance for Scholars attending Public Elementary Schools" marks a great advance in our educational methods.

The place and power of the citizens of to-morrow depend on the health and character of the children of to-day. We are rapidly learning that tuberculosis is widely prevalent among children, and that there can be no chance of eliminating the scourge so long as the hygiene of early days is neglected.

The fact is that anti-tuberculosis teaching must begin with the scholars in the school. Every teacher should be trained to take an effective part in the crusade against tuberculosis, and each child in our public schools must be instructed in the means of self-preservation from the subtle foe. It is estimated that in the public elementary schools of England and Wales alone there are over 6,000,000 children : here is an opportunity for the exercise of an anti-tuberculosis influence which shall be limitless in its beneficence.

In various Trans-Atlantic cities school-children are receiving anti-tuberculosis instruction from peripatetic lecturers, by the distribution of literature, and through the judicious employment of portable exhibitions. The American National Association for the Study and Prevention of Tuberculosis state that "over 2,500,000 of the 17,000,000 school-children enrolled in the United States have during the school year just closed been systematically instructed concerning the dangers of consumption, and the methods for its cure and prevention," and it is estimated that "fully 1,000,000 more have received instruction at the various tuberculosis exhibits held in all parts of the country or in separate classes and organizations." All this is excellent, and will count in coming days. We are, however, strongly of opinion that the ordinary teacher, when properly trained in hygienic principles and practices, should form the most reliable and effective instructor. If the co-operation of the teacher is obtained, much is won, for it is the teacher who controls and counsels, guides and governs, directs and explains, not only by spoken language, but by all the subtle powers of personal example, school *esprit*, and that intangible, indefinable atmosphere which is an all-pervasive environment powerfully moulding human destinies.

We would urge upon all concerned for the well-being of the nation's children, from the President of the Board of Education down to the humblest pupil-teacher, the urgent need of making anti-tuberculosis teaching a prominent feature in the curriculum of every school. If such could be provided the surest and speediest means for securing the abolition of the insanitary school would have been attained, and a long step taken towards the realization of the ideal—sound scholars in every school.

SPECIAL ARTICLES.

ROBERT KOCH: AN APPRECIATION.

By S. ADOLPHUS KNOPF,

M.D., NEW YORK CITY,

Professor of Phthisio-Therapy at the Post-Graduate Medical School,
University of the State of New York.

To be asked by the BRITISH JOURNAL OF TUBERCULOSIS to write an appreciation of the greatest living medical scientist, not only of Germany, but of the entire world, is an honour which I highly value. Yet I fear that my pen is too feeble to do justice to the theme, even were the space at my disposal unlimited. But whatever may be the shortcomings of this tribute to the greatest master of modern medical science, I want him and the readers of the BRITISH JOURNAL OF TUBERCULOSIS to be assured that this appreciation comes from the heart, and is written by one who, through twenty-five years of labour in the tuberculosis field in this country and abroad, in many climes and under various social conditions, has learned to appreciate, more perhaps than many others, the full value of Koch's immortal discoveries and his tireless labours.

Among the literature at my disposal, one of the most significant books regarding the life of Koch is the "Festschrift," which was presented to him by his pupils on the occasion of his sixtieth birthday, on December 11, 1903. As an introduction to the book, his pupils quote the words of the German poet :

" Weite Welt und breites Leben,
Langer Jahre redlich Streben,
Stets geforscht und stets gegründet,
Nie geschlossen, oft geründet."

This might be translated into English as follows :

" A larger world, a broader life,
Many years of honest strife,
Ever searching, e'er creating,
Never ending, oft attaining."

These words, indeed, are applicable to the life of Koch.

To give a list of only the most important of this master's works, beginning with his first prize essay as a student in 1865, on "The Anatomy of the Nerve-Ganglions of the Uterus," and ending with his great address at the International Tuberculosis Congress held in Washington last year, would take far more space than can be allotted to this article. Thus I can only enumerate some of the epoch-making

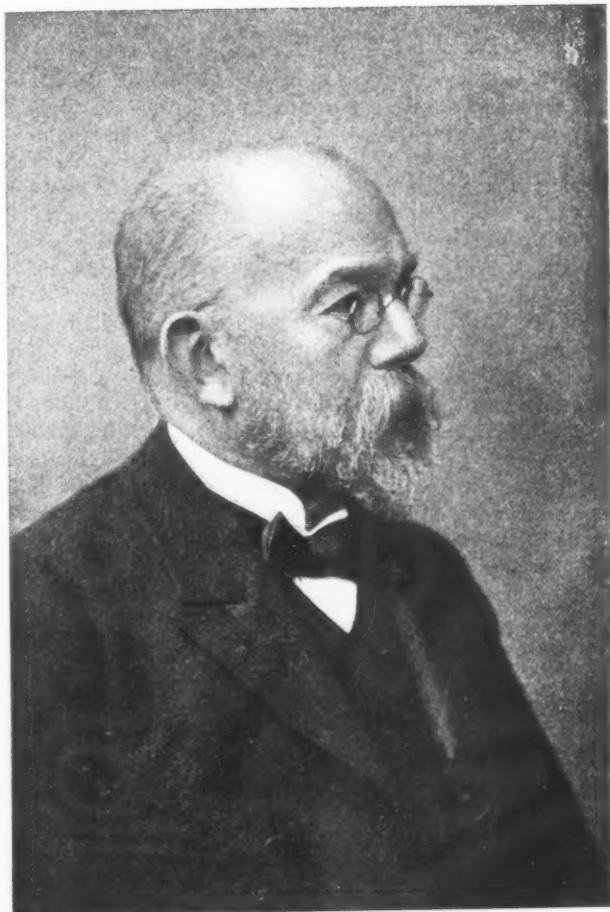
contributions made to science by this great man, such as the discovery of the spores of the anthrax bacillus in 1876; his monograph on "Researches in the *Aëtiology of Surgical Infections*," 1878; the discovery of the bacillus of tuberculosis in 1882; the discovery of the bacillus of Asiatic cholera in 1883; and the discovery of tuberculin in 1890. His more recent works on tropical malaria, sleeping sickness, and on typhus fever, are of no less importance.

Few men have travelled as much and as far as Koch in order to be helpful in the combat of endemic and epidemic diseases. In 1883, at the time when a fearful epidemic of cholera decimated the population of Egypt, he went thither to study the causes and prevention of the disease. In civilized countries we are now in a position, by early and accurate diagnosis, quarantine, proper hygiene and sanitation, to reduce the mortality from cholera to a minimum, and we owe the victory over this once so prevalent and fatal plague to Koch.

Because of his extraordinary thoroughness as a bacteriological diagnostician, hygienist, and sanitarian, the German Government avails itself of his services every time it has a local epidemic of a serious infectious disease anywhere in the Empire.

In the year 1906 Koch extended his researches far beyond his native land, going to South Africa, East India, and later on to German East Africa. In Africa he was able to discover a vaccination method as protection against the rinderpest. He studied the bubonic plague and other tropical diseases where they were endemic, and wherever he went he instituted such prophylactic and sanitary measures as to bestow lasting benefit on regions which were formerly devastated by seemingly unconquerable diseases and plagues.

Without minimizing any of the great master's discoveries or scientific labours, I do not believe I commit any error in saying that the communication which he made, on the evening of March 24, 1882, before the Physiological Society of Berlin, entitled "The *Aëtiology of Tuberculosis*," was his most important contribution to medical science. When we bear in mind the sociological aspect of the disease whose aetiological factors and primary cause were revealed to the world in this communication, well may we say that the 24th of March of 1882 was a "red-letter day," to be for ever remembered in the annals of medical history and human progress. Thanks to Koch, tuberculosis can be considered to-day a preventable disease. It was he who showed us where to find the cause of this enemy of mankind, and how to combat it. Because Koch taught us that the infectious agent—the tubercle bacillus—was alone responsible for the disease, and could be found in the pulmonary secretions of the consumptive, and that, if carelessly deposited, the dried and pulverized sputum containing the germ could be inhaled and ingested by others, producing the disease:



A. Koch.

anew, we have virtually become masters of what was once considered not only the most prevalent, but the most fatal, affliction of man and beast. Through the discovery of the tubercle bacillus alone, Koch has made mankind his everlasting debtor. When to-day, as is the case in some localities in America, in England, and in Germany, the mortality from tuberculosis has been reduced to wellnigh half of what it was prior to Koch's discovery and isolation of the tubercle bacillus, the saving of life, the lessening of physical suffering, this diminution of the social misery which accompanies all diseases of the masses, is all due to Robert Koch. The financial gain which has accrued to countries and communities which have followed Koch's teachings regarding the prophylaxis of tuberculosis in man, by preventing costly invalidism, saving countless valuable lives, and retaining them as breadwinners and useful citizens, is beyond human calculation.

By his discovery of tuberculin he has added an invaluable agent to our methods of early diagnosis of tuberculosis in man and beast, and given to our armamentarium in tuberculo-therapeutics a very important remedy. Through the tuberculin test in cattle, the weeding out of tuberculous animals has been made practical, and an incalculable benefit bestowed upon animal industry and the dairy business; and possible sources of tuberculous transmission from beast to man have been reduced to a minimum. The same may be said of Koch's discoveries regarding anthrax and rinderpest.

The vast and inestimable good this one man has been able to bestow upon mankind by his scientific labours will for ever remain unique in the history of human possibilities.

The life of Robert Koch should serve as an inspiration, not only to us who are his humble disciples, but to all mankind. The motto of his first scientific communication was "Nunquam otiosus" ("Never idle"), and he has adhered to it to this day. In scientific research, in constant work to combat disease and make mankind healthier and happier, this great man finds his reward. His honours and distinctions are numerous. He has the title of Excellency, is a Real Privy Councillor, and an Honorary Professor of the University of Berlin. He is a member of nearly all the great scientific societies of the world, and has been decorated by nearly all the monarchs of Europe and Asia.

May this great master's life be spared for many years to come, and may he be privileged to see the fruits of his labours—the banishment of disease, and the spread of health, peace, and happiness throughout the world!

We are indebted to the courtesy of Professor Knopf and his publishers (Messrs. Moffat, Yard and Company, of New York) for permission to reproduce the excellent photograph of the subject of this "appreciation." Robert Koch's portrait appears as frontispiece in Dr. Knopf's recently published "Tuberculosis: A Preventable and Curable Disease."—EDITOR, *B.J.T.*

THE CRUSADE AGAINST TUBERCULOSIS IN HUNGARY.

BY DR. D. O. KUTHY,

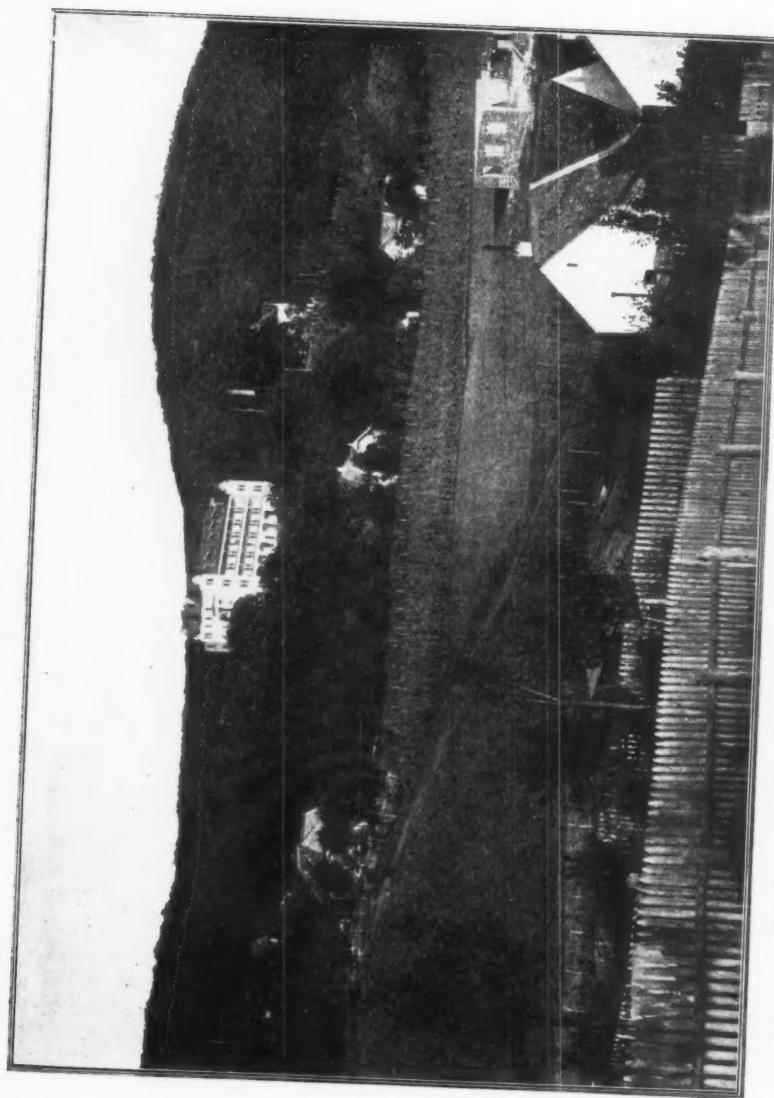
Royal Councillor; Medical Director of the Queen Elizabeth Sanatorium, Budapest;
Author of "The Cure of Consumption in Sanatoria."

IN Hungary the movement against tuberculosis began in 1894. On September 7 of that year, during the International Congress on Hygiene and Demography held in Budapest, Professor Ernest Leyden, of Berlin, delivered a remarkable lecture on the treatment of consumptive patients in sanatoria. During this congress Baron Frederich Korányi, Professor of Medicine at the University of Budapest, and Member of the Upper House of the Hungarian Parliament, remarked that he had already received 20,000 crowns from an anonymous philanthropist for the purpose of building the first Hungarian sanatorium for consumptives.

On the initiative of Baron Frederich Korányi, a small circle of philanthropists met on June 3, 1897, in the hall of the Medical Society in Budapest, to arrange for the establishment of a suitable sanatorium for poor consumptive patients. A committee was formed, with Baron Frederich Harkányi as president, and Baron Frederich Korányi as vice-president. The writer acted as hon. secretary. As a result of this meeting, a Sanatoria Association was formed on May 3, 1898, and a Board of Management elected, with Count Lewis Batthyány as president, Baron Frederich Harkányi and Baron Frederich Korányi as vice-presidents, and Drs. Desider Kuthy and Francis Tausz as hon. secretaries. Princess Klotild acted as patroness of the ladies' committee, and appointed the Countess Géza Andrassy to serve as chairwoman.

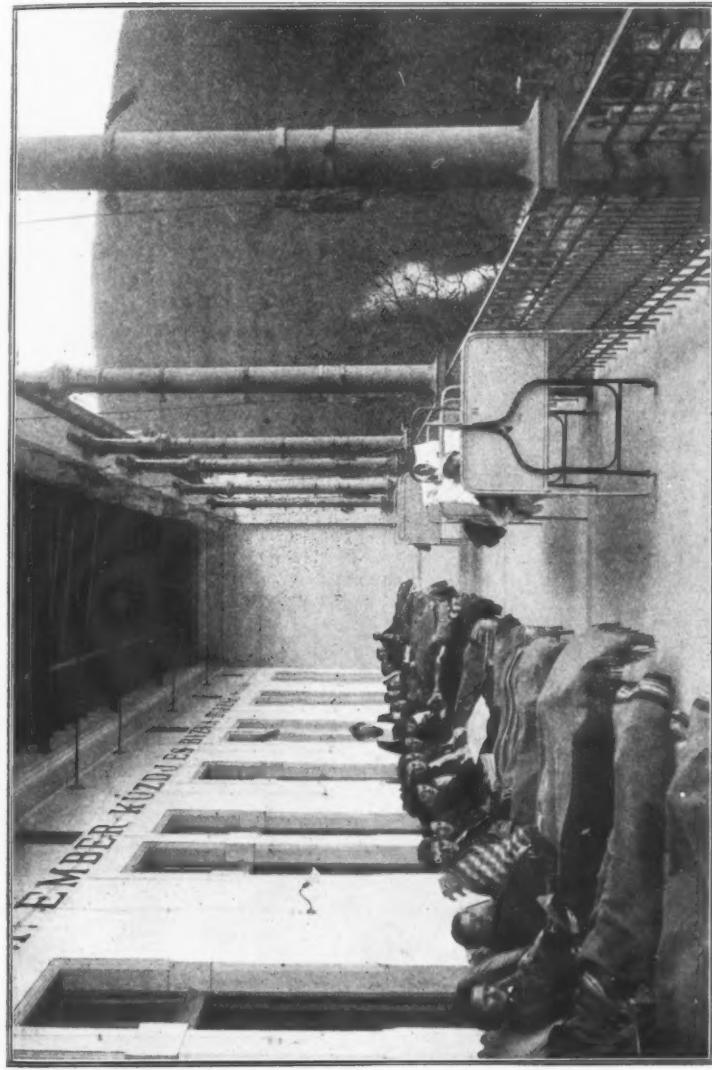
The Hungarian Press had meanwhile drawn the attention of the public to the vital importance of the social struggle against tuberculosis, and warmly supported the establishment of sanatoria. The writer issued in 1897 a book of 300 pages, with fifty illustrations, entitled "The Cure of Consumption in Sanatoria." This work afforded exact information regarding the facts and principles of the anti-tuberculosis movement, and showed that tuberculosis was one of the commonest and most serious diseases prevailing in Hungary. It was shown that those living in the lowlands of Hungary suffered the most from tuberculosis.

The first practical result of the anti-tuberculosis movement in Hungary was the opening of a small sanatorium for working-men



THE FIRST HUNGARIAN PEOPLE'S SANATORIUM: QUEEN ELIZABETH SANATORIUM, NEAR BUDAPEST.

THE FIRST HUNGARIAN PEOPLE'S SANATORIUM : QUEEN ELIZABETH SANATORIUM, NEAR BUDAPEST.



OUTDOOR LIFE IN THE QUEEN ELIZABETH SANATORIUM

at Szentendre, near Budapest. This had twenty-five beds, and was erected by the Budapest Sick Fund.

In 1898 His Majesty the King became the patron of the Budapest Sanatoria Association, and granted permission for the sanatorium to be named after Her Majesty the late Queen Elizabeth of Hungary. On June 21, 1899, the Town Council of Budapest granted 86,300 square metres of the Budakeszi forest, and undertook to defray a part of the expenses incurred in road-making and the provision of an adequate water-supply. On July 13, 1899, there was formed the Hygienic Committee of the Sanatoria Association, with Baron Frederich Korányi and Professor Kálmán Müller as presidents. In the same year Professor Victor Czigler offered to provide gratuitously plans for the proposed sanatorium.

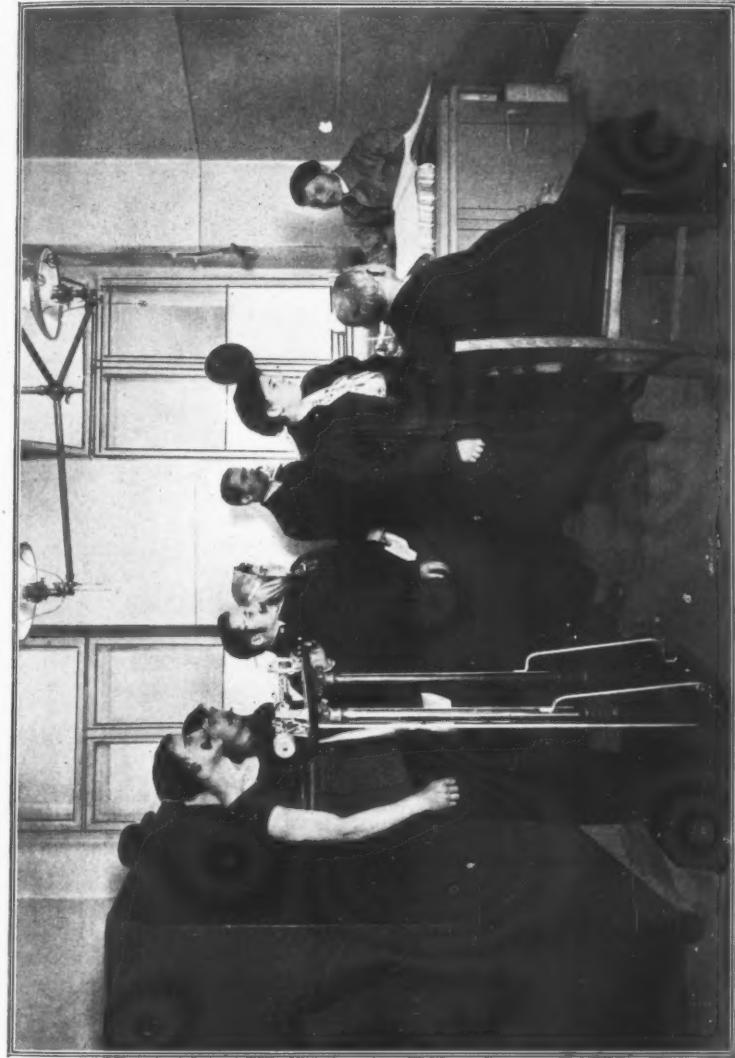
At the beginning of 1900 the fund of the Sanatoria Association exceeded 400,000 crowns. The collection of this sum was due to W. Ormody, a Member of the Upper House of the Hungarian Parliament. The building was begun in September of the same year, and on November 13, 1901, the Queen Elizabeth Sanatorium was opened with 126 beds. From the first the sanatorium has been a great success, and the Sanatoria Association now purposes to enlarge the establishment by 100 beds. The writer has acted as medical director and head-physician of the sanatorium since its initiation, and Dr. Tauszk has served as first secretary of the Sanatoria Association.

The establishment of a large central sanatorium has stimulated interest throughout the land. The Minister of Internal Affairs issued a decree in 1897 to all County Councils, directing that measures against tuberculosis should be systematically undertaken. In 1899 placards giving instructions regarding the prevention and treatment of tuberculosis were posted by his order all over the country. The Minister of Commerce also ordered preventive measures to be adopted in factories, railways, and among shipping.

The Medical Officer of Health of the Town Council of Budapest proposed, as far back as 1898, the obligatory disinfection of all dwellings in which death from tuberculosis had occurred.

In 1900 the first steps were taken at Szeged and Nagyvárad to found sanatoria for the people. In 1901 the Békés County Council, on the proposal of the Sheriff, George Lukács, voted a separate tax for the erection of a sanatorium for consumptive patients—*i.e.*, $\frac{1}{2}$ per cent. of the State tax. A Sanatoria Association was formed there too, with H.R.H. Prince Joseph as patron. Its fund in the first year amounted to 61,241 crowns, and several parishes offered ground and bricks for the building of a sanatorium.

In 1901 the Nyitra County Council voted 83,000 crowns for a separate tuberculous pavilion in the County Hospital.



THE DISPENSARY FOR CONSUMPTIVES IN BUDAPEST.

In the county of Vas, in 1902, an association was formed for prevention against tuberculosis, the zealous promoters being Stephen Bezerédy and Alexander Gerlits. It is worth mentioning that a small village called Velem, which has not even a post-office of its own, and consists only of seventy houses with 373 inhabitants, offered ground, stones, and carting free of charge for the building of a sanatorium.

Later on similar associations were formed at Hódmezövásárhely, Pozsony, and in other communities. In 1902 popular pamphlets were issued by the Ministry of Internal Affairs, treating of simple hygienic measures for the prevention of tuberculosis.

Since 1903 there has been published *Tuberculosis*, a periodical edited by Dr. D. O. Kuthy and F. Tauszk on behalf of the Budapest Sanatoria Association.

As a new source of revenue for the sanatoria funds, in 1903 permission was given by the Hungarian Parliament for the issue of lottery tickets for the enlargement of the Queen Elizabeth Sanatorium, and in 1904 by the Government for the arranging of a lottery with object prizes to increase the fund of the Prince Joseph Sanatoria Association.

The Queen Elizabeth Sanatorium, on May 24, 1904, was visited by His Majesty King Francis Joseph.

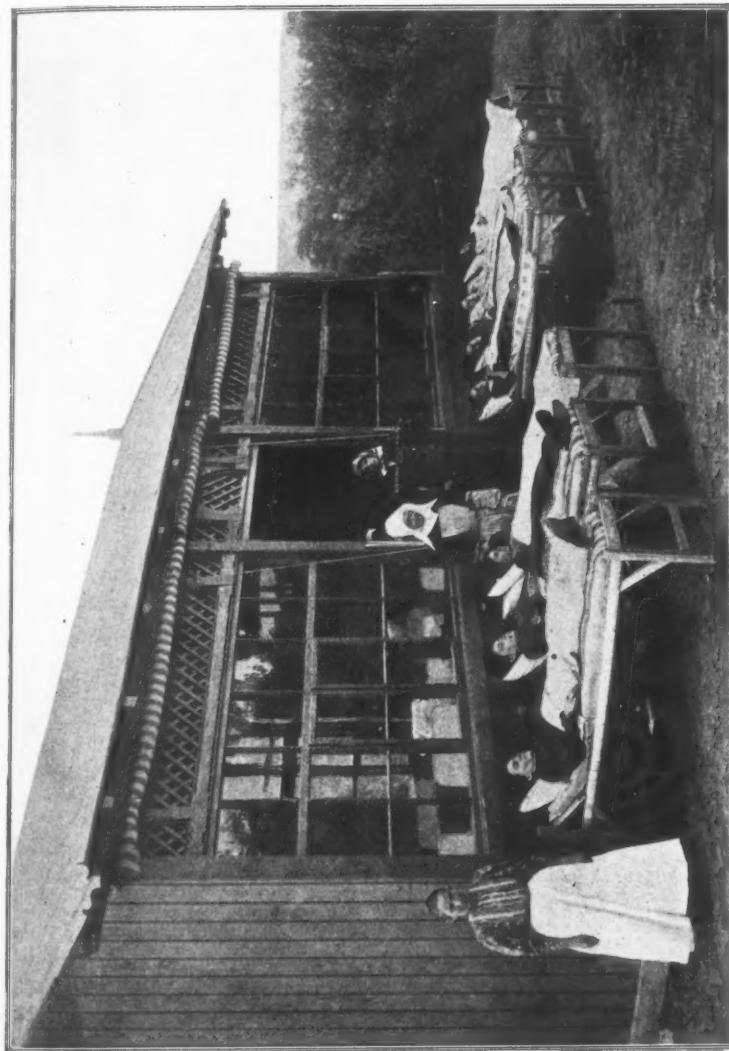
In the same year Lazarus Dungyerszky, a landlord in the County of Bács, made a grant of 100,000 crowns to the Budapest Sanatoria Association. Also the illustrious family, Baron Hatvany-Deutsch, granted 80,000 crowns to the institution.

According to the proposal and plans of Professor Kálmán Müller, Member of the Upper House and Director of the Budapest Town Hospitals, the Town Council provided airy tents near the pavilion in the St. Stephen Hospital for consumptive patients. In the following year special pavilions were built for patients to enjoy the benefits of open-air treatment.

In this year a sum of more than 25,000 crowns was gathered for the purpose of erecting a sanatorium for printers. A separate pavilion for consumptive patients has been added to the hospital at Baja. In the same year, at the suggestion of Theodor Haraszti, the Tisza-köröszug Association was formed to assist consumptive patients. This was the first germ of the Tuberculosis Dispensary movement in Hungary. Professor Kálmán Müller, the well-known art connoisseur, provided means for the provision of ambulances, free of charge, for consumptive patients.

At the national teachers' meeting, held in 1904, Dr. Kuthy delivered a lecture on "Teachers and the Struggle against Tuberculosis," and a year later the subject of tuberculosis was brought before the International Prison Congress.

PART OF THE FIRST RECREATION COLONY FOR CONSUMPTIVES IN HUNGARY (NAGYVÁRAD).



In 1905 Stephen Bárczy, at the time chief of the Board of Education, and now Mayor of Budapest, distributed boards containing rules of health printed for schools.

Popular lectures are held throughout the provinces. Diagrams and models are supplied by the editors of *Tuberculosis*.

In Kolozsvár a separate pavilion in connection with the University Clinic has been erected for consumptive patients.

During the ministry of Count Andrásy since 1906 the struggle against tuberculosis has made great advances. The first sputum-examining hall in Hungary was erected by him in 1906. He also arranged for the provision of disinfecting stations and the obligatory notification of consumptive cases. Later he issued a decree providing for the protection of children of the State asylums from tuberculous infection in their foster homes.

Count Andrásy, in 1906, presided over a meeting called to discuss the whole question of tuberculosis. Amongst others, Professor Kéty argued in favour of measures to restrict the spread of the disease by limiting the channels of infection. Professors Müller and Korányi proposed the appointment of a Royal Commissioner to inquire fully into all matters concerning tuberculosis.

In 1906 the Queen Elizabeth Sanatorium won the first prize at the Milan World Exhibition.

In November, 1906, the Trans-Danube League for the Prevention of Tuberculosis was established, with Count Batthyány as first president. On the same occasion there was opened the first Hungarian dispensary at Szombathely, and soon after a second one was established at Temesvár.

In this year also were formed unions for the prevention of tuberculosis at Temesvár and at Trencsén.

An article of Count Leopold Edelsheim-Gyulay on Tuberculosis and Protection of Children aroused considerable interest.

In 1907 the Prince Joseph Sanatorium was opened at Gyula with 100 beds. The town of Nagyvárad decided to erect a dispensary, and the city of Budapest began to build two pavilions in connection with the new St. John's Hospital. At the suggestion of Count Andrásy and Count Batthyány, a movement has begun with the aim of erecting a dispensary on a large scale in Budapest.

Dr. Leo Liebermann, Professor of Hygiene at the University of Budapest, at the wish of the Public Health Council, worked out a scheme for the establishment of a country colony for consumptives.

In the autumn of 1907 an International Workmen's Welfare Exhibition was held in Budapest, and the question of tuberculosis was prominently brought forward by a collection of specimens, etc., of the Hungarian Institute of Social Service.

TUBERCULOSIS MUSEUM IN THE BUDAPEST INSTITUTE OF SOCIAL SERVICE.



In 1908 the dispensary in Budapest began its activity under the presidency of Professor Alexander Korányi, with Docent Francis Tauszk as secretary, and Dr. Joseph Kovács as chief physician. A third sanatorium, erected by the State for its workmen, was opened last year. In 1908 also the first recreation colony at Nagyvárad and the first forest school at Szombathely were established.

During the present year a tuberculosis museum has been formed as a section of the Hungarian Institute of Social Service (Director: M. Szántó), and has a library in connection with it. Both the Government and Town Council of Budapest have begun to build houses for workmen in the suburbs of Budapest as well as in the plain lands. Many thousands of health-promoting houses will soon be ready for occupation.

In the State Preliminary for 1909 the Ministry of Internal Affairs was supplied with 500,000 crowns for the purpose of supporting the anti-tuberculosis movement. From this sum 50,000 crowns were granted as a yearly aid to the Budapest Sanatoria Association. The erection of a new dispensary in Szabadka has also been decided on.

The Ministry of Agriculture has taken steps for the extirpation of bovine tuberculosis. The Ministry of Commerce, through the Institute of Social Service, issued two instructive books, with numerous illustrations, written by Dr. D. O. Kuthy—the larger one, "Tuberculosis," for the educated public; a smaller one, "Illustration Book of Tuberculosis," for the people. The author of these books has given lectures on Tuberculosis in the College for Teachers.

The Institute of Social Service has made arrangements for regular lectures in the provinces, especially where large numbers of workmen live, and several societies are already supporting this plan; the first amongst them is the Hungarian Ladies' Club League, with Countess Batthyány as president, and A. Rosenberg as vice-president.

Lately a philanthropist has offered 50,000 crowns for the erection of a sanatorium in the Fejér country.

Finally, we may mention the production of two maps, exhibited at the Congress on Tuberculosis in Washington, 1908, which show that while Hungary in 1898 only possessed five institutions for the practical conduct of the anti-tuberculosis movement, it now, if we count the local committees of the Prince Joseph Sanatoria Association, has nearly two hundred institutions active in the crusade against tuberculosis.

The accompanying illustrations will serve, in some measure, to indicate the practical nature of the anti-tuberculosis campaign in Hungary.

ORIGINAL PAPERS.

THE HEART IN PULMONARY TUBERCULOSIS.

By JOHN HAY,

M.D., M.R.C.P.,

Assistant Physician to the Royal Infirmary, Liverpool; Late Physician to the Liverpool Hospital for Consumption and Diseases of the Chest.

In the large majority of patients afflicted by pulmonary tuberculosis the heart is free from valvular disease, and when such a lesion does occur its effect is hardly taken into consideration in the management of the case. A correct appreciation of the rôle of the circulatory apparatus in pulmonary tuberculosis is, notwithstanding, of some moment in diagnosis, prognosis, and treatment.

There are several standpoints from which this subject can be viewed — *i.e.*, the effect of sclerosing endocarditis and valvular deformity on tubercular infections of the lung; the influence of the toxins of the tubercle bacilli on the circulatory and vaso-motor mechanisms; the effect of the conservative and compensatory changes in the lungs on the various chambers of the heart; the effect of the asthenia, pyrexia, and general emaciation on the myocardium; the cause of dyspnoea and the effect of exercise.

It is very generally recognized that there is a certain antagonism between valvular disease and tuberculous disease of the lungs. This is borne out by the figures published by numerous writers, in which it is seen that the liability to tuberculous infection of the lungs is lessened among those suffering from chronic valvular disease, and, on the other hand, that among tuberculous patients there is a diminished incidence of heart trouble. The explanation for this is not obvious, unless it be that the pulmonary congestion resulting from valvular disease exerts an antagonistic influence on the activity and growth of the tubercle bacillus.

Results of the Toxins produced by the Tuberclie Bacillus.

Toxic effects are very important, both in diagnosis and in prognosis. One striking effect of the toxæmia is its effect on the frequency of the heart's action—a tachycardia results, of which the patient may

or may not be conscious.¹ This is sometimes one of the first indications of tuberculous infection, and possibly it may happen that it is only after watching the patient for some months that the true significance of the tachycardia is revealed, and the exciting cause manifests itself by local signs. It is probable that the increased rapidity is due to the toxic products of the bacilli on the circulatory centre in the medulla. Similarly, we may find the stimulation involving the respiratory centre and causing accelerated respiration.

Early tachycardia and tachypnoea may be unaccompanied by any elevation of temperature, and this combination of tachycardia and a normal or subnormal temperature, especially if tachypnoea is present in addition, justifies a very gloomy prognosis, and suggests the existence of a lowered resisting-power and an intense toxæmia. In my experience these patients go steadily from bad to worse, and unless one recognizes the import of the tachycardia, there is a danger of being led by the absence of pyrexia and the paucity of local manifestations of disease to give a prognosis whose optimism is unwarranted.²

The frequency of the heart's action should be systematically charted in every case of incipient phthisis, and its relation to the temperature and the number of respirations noted. The effect of treatment in lessening the toxæmia can in part be gauged by its effect on the pulse-rate. Later in the disease, variations in the pulse-rate are not of the same significance, as so many additional factors are present liable to influence the frequency; for example, pyrexia, secondary infections, extensive disease, pulmonary fibrosis, emphysema, and a rapid increase in weight where overfeeding has been carried out. Nevertheless, at every stage of the disease a quiet action of the heart is a satisfactory indication of progress.

Cardiac arrhythmia is very rarely met with, and when present is of little significance in itself.

In pulmonary tuberculosis the tachycardia instead of being continuous may be temporary, and brought on by very slight and apparently insufficient causes, such as emotion, excitement, eating a meal, or by slight exercise. In addition to this instability of the heart's action, there is, in many patients, a marked irritability of the vaso-motor mechanism. Transient flushings and blotchiness of the skin, with ready and profuse sweatings, the latter often being localized to the axillæ, are not at all uncommon.³

There is usually some definite lowering of the blood-pressure in

¹ Vialard, M. F.: "The Persistent Apyretic Tachycardia of the Onset of Acute Tuberculosis," *Bull. Gen. de Thérapeutique*, vol. cxlv., p. 277. 1903.

² Hay, John: "The Early Diagnosis of Consumption," *Lancet* April 20, 1907.

³ Turban, K.: "The Diagnosis of Tuberculosis of the Lung." London: John Bale, Sons and Danielsson.

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phthisical patients, the pulse feeling soft and compressible to the finger. In 100 patients suffering from pulmonary tuberculosis, Marfan found the blood-pressure lowered in all except in three, and these three were suffering from arterio-sclerosis.¹

It is not difficult to understand why the blood-pressure tends to be low when one remembers the deteriorating effect of the toxins on the myocardium, and the tendency to vaso-dilatation which is present in this class of patient. Turban considers this lowering of the blood-



FIG. I.—CAST OF THE RIGHT CAVITIES OF A HEART WITH NO VALVULAR LESION.

P, pulmonary artery; C, conus, and S, sinus, of the right ventricle; A, right auricle.

pressure as a valuable diagnostic sign, and especially useful in differentiating between the chlorotic anaemia of early tuberculosis and ordinary chlorosis. In the latter it is usual for the blood-pressure to be slightly increased.

Mechanical Interference with the Action of the Right Heart.

In contradistinction to the group of symptoms just described and produced by the action of the toxins on the myocardium and the central nervous system, there is another group where the symptoms

¹ Marfan: "Tuberculosis and Acute General Miliary Tuberculosis," quoted in "Nothnagel's Encyclopedia of Practical Medicine," p. 392.

of cardiac inadequacy are the outcome of mechanical interference with the work of the right ventricle.

When there is an extensive involvement of lung-tissue, a considerable proportion of the capillary bed is destroyed, and a virtual stenosis is produced in the pulmonary circuit. Extra work falls on the right ventricle, and leads to hypertrophy, and sooner or later dilatation; the onset of this dilatation is facilitated by the impaired oxygenation of the blood flowing through the coronaries; the poorly nourished myocardium is unequal to the strain, and yields. Dilatation of the right ventricle is nearly always present in any case of long-standing extensive mischief, though the condition may be masked to physical examination by an associated emphysema or displacement of the heart. Frequently in these patients the conus of the right ventricle is very considerably dilated. Fig. 1 represents a cast of the right cavities of the heart removed from a patient who died of phthisis. It illustrates the very definite dilatation of both conus and sinus of the right ventricle, but more particularly of the conus, and also demonstrates the considerable narrowing of the chamber of the right ventricle where the sinus passes into the conus. This constriction is especially marked in many of the hearts seen at autopsies on phthisical patients. The dotted line on the cast indicates the stricture.

The above observations explain the limitation of the area of cardiac response, the diminished reserve power, so frequently found in phthisical patients, and should sound a note of warning against the indiscriminate overfeeding and fattening which is favoured by some authorities. The amount of work a heart is called upon to do, other things being equal, varies with the weight of the individual, and these atrophied and fatty hearts are often quite unequal to the task of meeting adequately the requirements of an individual who has added rapidly and considerably to his weight. The outcome of such a method is to overtax an already impaired myocardium, and cause distressing dyspnoea on any but the slightest exertion.

The Relative Infrequency and Quiescence of Pulmonary Tuberculosis in Patients suffering from Valvular Disease.

Chronic sclerosing endocarditis is not commonly associated with pulmonary tuberculosis, and the incidence of tuberculous infection of the lungs in those suffering from valvular disease is less than among patients free from such taint. It is also noteworthy that the tuberculous disease is usually of the quiescent type, or manifested only by cicatrization of the apices.

In the Royal Infirmary, Liverpool, from 1898 to 1907 inclusive, 143 autopsies were performed on patients who had suffered from

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valvular disease of the heart ; of these 11, or 7·6 per cent., showed some tuberculous disease in the lungs. In 9 of these 11 the disease was either quiescent or indicated by scarring and adhesions about the apices ; in one there was old-standing excavations of limited extent, and in another the disease was active.

During this same period 1,540 autopsies in all were performed, including the 143 suffering from valvular disease ; 190 of these were patients suffering from some degree of pulmonary tuberculosis, which gives a percentage for the whole period of 12·3.

We see, therefore, that while the percentage of cardiac cases affected by pulmonary tuberculosis is 7·6, the percentage among all classes of cases was 12·3, or 4·7 per cent. higher than among the cardiacs only.

The following case is typical of the class we are discussing : T. C., male, aged forty-eight. Rheumatism thirty-two years ago. Ill for the last three years. Admitted to hospital with sudden dyspnoea, cyanosis, chest full of râles. No oedema of the legs. Death sudden. Post-mortem : Heart 20 ounces ; pericardium adherent all over ; myocardium good condition ; left ventricle hypertrophied and dilated ; mitral orifice funnel-shaped and admitted one finger, old calcified vegetations on the auricular surface ; aortic valves calcified and fused ; right ventricle hypertrophied and dilated ; right auricle dilated ; tricuspid orifice admitted four fingers. Lungs, pleural cavity contained clear fluid, several adhesions in each cavity, old tubercles at the right apex, parenchyma of lung extremely oedematous, shows brown induration ; no infarctions. Liver 3 pounds, nutmeg ; spleen 10 ounces, tough.

In this case it is obvious that the essential condition was one of heart disease, and that the tubercular mischief was an unimportant incident in the course of the malady. Included in the series referred to above there were three autopsies on patients suffering from pulmonary stenosis. In only one of these was there tubercular disease. These figures correspond fairly closely with those of other writers. For example, in 388 autopsies upon patients dying with valvular disease pulmonary tuberculosis was present in 26, or $6\frac{1}{2}$ per cent. ; and Meisenberg found that 7 per cent. of all the patients attending the Leipsic Clinic with heart disease were suffering also from pulmonary tuberculosis.¹

In 107 autopsies in cases dying from heart disease with lesions of the valves, Birch-Hirschfeld found the lung affected by tubercle 5 times, or 4·6 per cent., and 2 cases of pulmonary stenosis showed pulmonary tuberculosis.²

¹ Osler and McCrae : "A System of Medicine," vol. iii., p. 321.

² Birch-Hirschfeld : Quoted in "Tuberculosis and Acute General Miliary Tuberculosis," in "Nothnagel's Encyclopedia of Practical Medicine," p. 321.

It is rare to find advanced disease of the aorta and extensive excavation of the lungs in the same patient. Such a condition was present in the woman from whom the heart and lungs represented in Fig. 2 were removed. She was fifty-two years of age at her death, which was caused by profuse haemoptysis due to the rupture of a vessel in the wall of the pulmonary cavity. The autopsy revealed marked aneurysmal dilatation of the aorta, A, and atheroma of the vessel-wall. As a result of the tuberculous disease, the excavated left

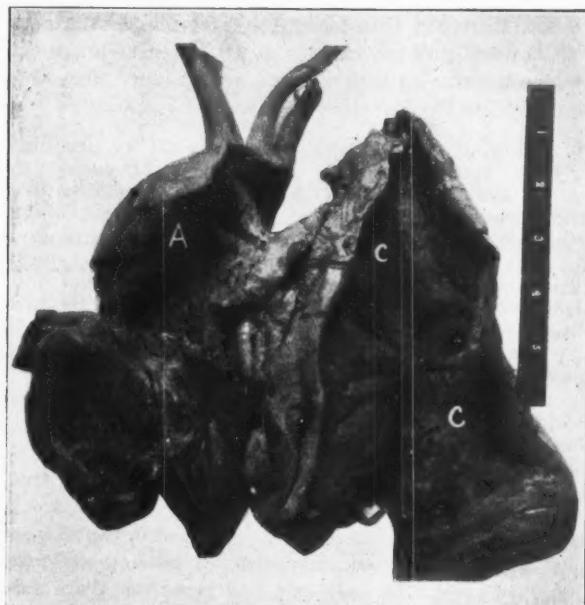


FIG. 2.—HEART AND LUNGS FROM PATIENT DYING FROM HÆMOPTYSIS.

A, degenerated and dilated aorta ; C, excavated lungs.

upper and lower lobes were united to form one large cavity, C, with thickened fibroid walls closely adherent to the thorax. The right lung was affected with tuberculous disease in a much less advanced stage. This patient was an inmate of Mill Road Infirmary, and I am indebted to Dr. Nathan Raw for permission to publish the photograph.

The Relative Infrequency of Valvular Disease in Consumptive Patients.

We have seen that pulmonary tuberculosis is relatively infrequent in those affected by valvular disease of the heart, and it is interesting

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to find the converse true. Patients who are consumptive are apparently less liable to suffer from valvular disease. The tuberculous disease seems in some peculiar way to inhibit the development of the valvular trouble.

During the years 1898-1907 inclusive, among 109 post-mortem examinations made in the Royal Infirmary, Liverpool, on patients suffering from all types of pulmonary tuberculosis, only 4 per cent. showed evidence of valvular disease of the heart; the majority of the hearts were smaller than normal, and many were typical examples of brown atrophy or fatty degeneration.

Brown states that in 8,154 autopsies made upon phthisical patients 293 were found to be suffering from cardiac disease, which gives 3·5 per cent., a percentage which closely corresponds with the figures obtained at the Royal Infirmary. In order to compare this percentage with the general incidence of valvular disease among all patients, we have analyzed the records of 1,540 consecutive autopsies at the Royal Infirmary, and find that 143, or 9 $\frac{1}{4}$ per cent., were suffering from valvular disease of the heart, which is a much higher percentage—in fact, more than double the incidence of valvular disease occurring among the consumptives.

Meisenberg found that among all the patients at the Leipsic Clinic from 1889 to 1898, 1·75 per cent. had heart disease; while the percentage suffering from heart disease among those affected by pulmonary tuberculosis attending the clinic during these years was only 1·14 per cent. These latter figures do not, of course, deal with autopsies, but with all the patients as they present themselves for treatment.

Endocarditis may occur as a complication of pulmonary tuberculosis. In most instances it is either a terminal infection or is due to streptococci or staphylococci and verrucose in type. Specific tuberculous endocarditis is of all forms the least common.

Tuberculous pericarditis must also be classed as another not infrequent terminal event in pulmonary tuberculosis. Very rarely it develops in the absence of tuberculous disease elsewhere. It is insidious in its onset, may be latent, and is probably overlooked until revealed by the autopsy.

Treatment.

Fortunately, on the rare occasions when both pulmonary tuberculosis and valvular disease do happen to coincide, the treatment of the two affections is not antagonistic. The rest which is such an important feature in the management of tuberculous patients is also an essential to an overworked heart. In the later stages, when the myocardium fails and compensation breaks down, the usual cardiac tonics

must be employed. Squills, digitalis, strophanthus, and senega then prove valuable.

In the earlier stages, when complicated by toxic tachycardia, the digitalis group is of little value, and the treatment must be directed towards diminishing the toxæmia by complete rest, careful dieting, freedom from emotional excitement, and specific vaccine therapy when available.

The extent to which the action of the heart is steadied by the treatment proves an excellent guide as to the efficacy of the means employed.

PULMONARY TUBERCULOSIS AMONG PRINTERS.¹

By T. D. LISTER,

M.D., M.R.C.P.,

Physician to the Mount Vernon Hospital for Consumption and Diseases of the Chest.

IN the supplementary volume to the Sixty-fifth Annual Report of the Registrar-General we have a mass of statistics and their analyses dealing with many of the varied activities of those who have the privilege of earning their incomes.

In order to know from these statistics whether any particular occupation presents an undue liability to any particular fatal disease, we must ascertain first of all what is the number dying therefrom per 1,000 among the general population, and compare it with the number it kills per 1,000 in the occupation we are studying. When we compare the printers with the average occupied population, we find that they die from consumption at a rate of 60 per cent. above the average. It is of interest to compare this excess among the printers with some of the figures of occupations which are healthier, and with those which are even more unhealthy, as well as with those which are most closely alike so far as the risk of consumption is concerned. The following is a list of certain occupations suffering from consumption given in the order of severity, beginning with those which are most severe. If we call the standard rate of dying from consumption figure 1, the numbers come out nearly as follows:²

¹ The above article is founded on an address delivered to the Printers' Medical Aid and Sanatoria Association on May 24, 1909.

² Statistics based on figures in the Supplement (Part II.) to the Sixty-fifth Annual Report of the Registrar-General, 1908. Table V., p. clxxxvii., Comparative

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Tin-miner	5
London beer trade (inn, hotel servant)...				4
General labourer (industrial districts) .				4
The scissors-grinder and cutler				3
Costermonger				3
General labourer				3
File-maker ...	...	...	...	2½
General shopkeeper				2
Lead-miner				2
Brush-maker				2
Furrier				2
Musician ...	...	...	...	1½
Dock labourer				1½
Printer ...	...	...	...	1½
Agricultural beer trade				1½

The above are the more consumptive occupations. Among the healthier occupations in respect to tuberculosis are the following :

Fishermen ...	...	...	...	3 5
Coal-miners				3 5
Chemical manufacturers				3 5
Navvy ...	...	...	...	1 12
Dairy trade				1 12
Lawyer ...	...	...	...	1 12
Gardener ...			under	1 12
Agricultural labourer			"	1 2
Brick-maker			"	1 2
Farmer ...	...	...	...	1 3
Doctor ...	...	...	...	1 3
Railway driver			...	1 3
Clergymen ...	...	...	under	1 3

Mortality Figures. A few selected occupations with the actual figures are here given :

PHthisis.

Tin-miners ...	838	Innkeepers' servants (in agricultural districts) ...	...	...	288
Men hotel servants (London) ...	669	ALL OCCUPIED MALES	...	...	175
General labourers (industrial districts) ...	567	Fishermen	...	...	96
Cutlers, scissors-makers ...	516	Coal-miners (Lancashire)	...	...	96
Costermongers, hawkers ...	516	Chemical manufacturers	...	...	96
General labourers ...	450	Platelayers, navvies	...	...	91
File-makers ...	375	Milksellers and cheesemongers	...	...	90
General shopkeepers ...	344	Barristers and solicitors	...	...	87
Lead-miners ...	317	Gardeners, nurserymen	...	...	83
Brush-makers	314	Agricultural labourers	...	...	82
Furriers ...	314	Brick and tile makers	...	...	72
Musicians, music masters ...	301	Farmers, graziers	...	...	66
Dock labourers, wharf labourers ...	291	Doctors	...	...	65
Printers ...	290	Railway drivers and stokers	...	...	63
		Clergymen, ministers	...	...	53

Though beer is often spoken of as though it was a part of the food of the people, yet the servants in the London public-houses and hotels, who enjoy such good opportunities of experiencing the strengthening effects of beer, die of consumption more than seven times as fast as those who have special facilities for consuming milk. No doubt there are other points of difference in the relative healthiness of the beer and milk trades, but at any rate the advantages of a free consumption of alcoholic drinks do not include strengthening the constitution against consumption. Let us look for a moment at those trades or professions which present a liability to consumption which is very nearly the same as that of the printer. We have the musician, the dock labourer, and the servants in the beer trade in the agricultural districts. One of these is a typical indoor occupation like that of the printer—namely, the musician—while the dock labourer and the innkeeper and servant in agricultural districts, are in the one case an outdoor occupation, and in the other very frequently a partly outdoor occupation.

The Cause of the Printer's Liability to Consumption.

There are certain axioms in relation to consumption which can be universally accepted. One I have ventured to express elsewhere in the formula : "The more income-tax you pay, the less liable you are to have consumption." I am quite willing to admit that printers share with all other paid workers in the recognition of the fact that their services to the community are badly remunerated, and that if they only had their proper appreciation they would receive higher salaries. But I do not think that a trade which has increased over 20 per cent. in number since the last census, and one in which there was at the last census barely 2 per cent. of unemployment, can be said to be in a bad condition. The modern dependence upon printers' ink for all purposes, so eloquently expressed by the Prince of Wales in his speech at the Festival of the Printers' Trade Charities this year, tends to keep up a high standard of employment. There can be but little poverty in the trade. On the other hand, it is undoubtedly true that phthisis is, at all events, from a national point of view, a poverty disease. The Right Hon. John Burns was once so good as to draw for me on a blotting-pad a little diagram which showed the relation of consumption to the State in a manner which was at once simple and convincing. With three lines, each passing downwards from the left-hand top corner of the paper towards the right-hand bottom corner, he produced a diagram in which the lines were defined by him as representing—one, the fall in the price of corn over a course of many years; the second, the fall in the proportion of poverty to the population; and the third, the general decline in the death-rate from

consumption. Nothing could be more striking as an illustration of the fact that consumption is a disease due to poverty and all that poverty implies, especially an insufficient supply of proper food.

But poverty, as we have seen, is not an explanation which can apply to printers as being the cause of their somewhat high mortality from consumption.

What unhealthy factors are there in the life and habits of the printer which may be suggested as causes, and which may be taken, therefore, as indications of the improvements to be effected in order to bring about a reduction in their risk?

Has drink anything to do with it? I pointed out that among the consumptive near relations of the printers were the musician, the dock labourer, and the agricultural beer trade. I have also said that drink is associated with a high mortality from phthisis. It is interesting to notice that when we look at our list of occupations with a high consumptive death-rate we find that several of them also have a high place in the list of trades having an excessive mortality from diseases associated with the excessive consumption of alcohol. I need not particularly refer to these tables,¹ as apart from the liquor trade there are many points which may lead to error in drawing too definite conclusions, but the musician and the dock labourer both show a high figure from drink diseases. The association of wine and song is proverbial, and possibly musicians suffer from some forms of nervous and emotional instability also, which are known to be conducive to consumption.

But among printers the mortality from drink is shown by the Registrar-General to be only *half the average*,² and excessive addiction to alcoholic drinks would therefore seem to be *not* the chief cause of the printers' high consumption mortality. I would like to add one word of warning against the misapplication of statistics. Because one

¹ Table IV., *loc. cit.*, pp. clvii., clxvii., Mortality Figures :

ALCOHOLISM.

OCCUPIED MALES (1900-1902)	...	...	...	16
Printers (1900-1902)	...	...	...	8

² Table V., *loc. cit.*, p. clxxxiii., Comparative Mortality Figures. A few selected occupations are here quoted with the actual figures :

ALCOHOLISM.

Inn, hotel servants (London)	...	157	ALL OCCUPIED MALES	...	...	16
Costermongers, hawkers	...	57	Printers	...	...	8
General labourers (London)	...	52	Coal-miners	...	...	5
Dock, wharf labourers	...	49	Gardeners, nurserymen	...	...	5
General labourers (industrial districts)	...	45	Chemical manufacturers	...	...	4
General shopkeepers	...	43	Agricultural labourers	...	...	4
General labourers	...	40	Railway drivers, stokers	...	...	3
Lead manufacturers	...	38	Clergymen, ministers	...	...	2
Musicians	...	36	Tin-miners	...	...	0

happens to be a printer, one does not escape half the effects of strong drink, and in some cases which I have seen among printers I had no doubt that the production of consumption was due to alcoholism.

Another condition which prevailed among printers formerly to a much higher degree than it does nowadays is lead poisoning, but this is now such a very rare event, although commoner among printers than among the general population, that I think we may disregard it as a cause of consumption.

One other poison in addition to alcohol and lead is tobacco, and the tobacco-worker has a slightly lower mortality for consumption than the printer, his being only about one and a half times the average. I am not sure whether printers abuse tobacco, though snuff is anything but unknown in the printing-office ; we may class this as an additional form of dust, and not lay too much stress upon the poisonous effect of tobacco in producing this disease.

Passing from the poisons to the personal habits of the printer, it is unnecessary to do more than to repeat the words which are always used by those engaged in preaching the holy war against consumption : "Please don't spit." Spitting, associated with busy traffic in confined spaces, whether those spaces be the four walls of a printing-office, a factory, a railway-carriage, or a covered way of any sort, is without doubt a cause of consumption. It is impossible for any of us to say that our expectoration is free from dangerous microbes. The healthy human mouth contains many disease germs. A reform in this matter of spitting indoors under conditions of mutual employment, or in crowded public conveyances, can only come by the precept and example of those who are able to speak as equals among the workers themselves. I have only referred to the matter for the purpose of reiterating that what has so often been said of the cure of consumption is equally true of its prevention. The blunt phrase is that "No fool was ever cured of consumption." As the cure of consumption to be lasting must depend upon the prevention of re-infection, it is clear that the absolute prevention of the disease and its long-predicted eventual disappearance can only come about by the clear understanding and practice of the simple laws of health in the homes, vehicles, meeting-places, and workshops of the people. Those who object to learn will never help to prevent the disease.

The explanation of the prevalence of consumption among printers to the extent of 60 per cent. above that in the average occupied male population is not, I think, to be found in their poverty, in their personal habits, in their addiction to alcohol, nor in any special condition of their employment, except that it is an indoor occupation carried on often under conditions of considerable stress, often at abnormal hours, and in an atmosphere which, in addition to

being dusty, is frequently also foul. Passing through the various stages of the production of the printed sheet from composing-room to machine, we see a trade which in all departments is carried on with but little attention to ventilation, either by the free circulation of the outside air, or the thorough removal of the used-up air indoors. There is but little time to spare amid the hum of the presses for the thorough cleansing of the printing-office. Better provision should be made for cleansing, especially by sweeping with sawdust moistened with an antiseptic, and used just before opening the office. Certain parts of the work correspond closely to the conditions found among the general metal-workers, but printers have a considerably higher mortality from consumption than the general metal-worker, whose mortality from pulmonary tuberculosis corresponds very closely to that of the general population. Wherein lies the difference in the effects of these employments in producing consumption? I think in the fact that printers often have to live close to their work in crowded parts of our cities, in order to reach their employment at abnormal hours. All workers who have to go on duty at abnormal hours are liable to neglect their nourishment, and to do a "day's" work at night under unhealthy conditions "on an empty stomach." A glass of rum and milk, the former valueless, and the latter usually of doubtful quality, is a common dose as a pick-me-up. Food before work is what is wanted, and even if it is only some sandwiches or hard-boiled eggs, it will lighten the performance of the duty. It would have been interesting to have been able to obtain a comparative study of the various branches of the printers and allied trades, but the only information that I have been able to get is that of the bookbinders and the lithographers and plate-printers. The bookbinders have about 50 per cent. excess of liability to consumption, the lithographers about the same, although a little less than the bookbinders.

I will only quote one more figure, and that is a very encouraging one.¹ Since 1880 the printers' mortality from phthisis has decreased over each period of ten years in the proportion of the figures 5, 4, 3, that of the whole population having decreased only in the proportion of about one-fifth. The dissemination of knowledge by associations formed among the members of a trade which must be admitted to be one of the most intelligent and best educated from its very nature, will, I hope, still further increase the rapidity of the elimination of consumption among workers in ink and type.

An interesting example of such work is that initiated by the New York Typographical Union No. 6, which issues the following circular:

¹ Table IX., p. ccx., Comparative Mortality of Printers from Phthisis in 1880-1882, 1890-1892, 1900-1902. For these periods the figures are 503, 421, 323 respectively. For ALL MALES, 234, 222, 186.

"Don't spit on the office floor, even if you haven't tuberculosis. Every chapel should pass a rule on this. Seventy per cent. of the members of No. 6 examined last year had catarrhal affections, which are easily transmitted. Don't work in a badly-ventilated, dirty, unsanitary composing-room. The labour law prohibits it, and your committee will enforce the section covering it, if notified. Report any case of tuberculosis in your office. Everyone is in danger from a careless consumptive. Don't operate an unpiped linotype. You are taking a needless and perilous risk. An open smelter is equally dangerous. Your committee will correct these evils immediately, if notified. Don't allow the floor to be swept during working hours. Your health has the paramount right. Don't forget that one of every four in the I. T. U. death-list dies of pulmonary affections; that the last United States census placed the second highest mortality from tuberculosis in the trade of printing, and that every thoughtful member has it in his power to alter these figures. If you suspect you have tuberculosis, see your physician and write the health committee. Both will assist you. Don't be afraid of a draught, if the window is open from the top and bottom. Fresh air is necessary every minute of the day in the average printing-office. Everyone in our business should walk at least three miles in the open air every day. Few members of this union are without intimate knowledge of the waste incurred by tuberculosis. Tubercle bacilli are tangible enemies of all who work, and should be persistently fought by sane living. Join a sick benefit society, preferably in your own office. There are more successful relief associations among printers than in any other craft, and they give help with self-respect. Remember that the perfected labour union is the most forceful agent of the century in preventing tuberculosis. Short hours and high wages will accomplish wonders in exterminating any disease, physical or social. Demand the union label and strengthen your organization."

VIEWS AND REVIEWS.

THE USE OF TUBERCULIN IN DIAGNOSIS AND TREATMENT.

SINCE the introduction of tuberculin by Koch, medical opinion and practice have varied greatly regarding its use in the diagnosis and treatment of tuberculous affections. Important modifications have been made in the methods of its preparation and the manner of its employment. Many brands of tuberculin are now available. Carefully devised procedures have been elaborated with a view to the securing of precision and safety in the employment of tuberculin in whatever form and manner used. And yet still "the actual toxin and mode of action of the tubercle bacillus remain unknown," as Dr. W. d'Este Emery puts it in his recently published able work on "Immunity and Specific Therapy." It is little wonder that wide divergencies exist among experienced practitioners, both in this and other countries, with regard to the employment of tuberculin. It would seem as though we are still to remain in doubt and perplexity as to the exact rôle which is to be allowed to tuberculin as a justifiable agent in the recognition, care, and control of tuberculous cases. This being so, it has been judged desirable to present the opinions of a number of experts whose views merit, and must receive, careful consideration.

FROM R. W. PHILIP,

M.A., M.D., F.R.C.P. EDIN., F.R.S.E.,

Physician to the Royal Victoria Hospital for Consumption, and to the Royal Infirmary, Edinburgh.

The discovery of tuberculin in 1890 meant an entirely new conception of treatment. During the years which have elapsed I have used tuberculin continuously. Looking back, it is gratifying to have the opportunity to state that throughout the period there has grown and remained with me the conviction, which is ever ripening, that in tuberculin we have a remedy of first importance in the treatment of tuberculosis. The cases treated have been very numerous, and of varying kinds and types. The net result is a decisive verdict in favour of tuberculin.

It is admittedly difficult to immunize a healthy animal against

tuberculosis. More difficult still is the attempt to immunize an animal already affected. The exact effect of varying doses of tuberculin on the subject infected with tuberculosis is obscure. It may be affirmed with reasonable certainty that pronounced reactions, both general and local, are to be avoided. On the other hand, it will be the conclusion of most observers that a mild reaction—using the term in its widest sense—local and general, is associated with progressive changes which make for improvement. A chief aim of clinical investigation should be the determination of the degree and limits of this serviceable effect. How are we best to attain satisfactory results? How are we to determine for different cases and conditions the optimum dose, and so exclude harmful effects which result from excessive dosage? It seems to me that, as physicians in immediate relation to the patient, we have methods of gauging from day to day the result of tuberculin treatment similar to, if not yet as certain as, those by which we gauge the effect and value of digitalis or other of the more potent drugs of the Pharmacopœia.

One of the more striking results of well-regulated dosage with tuberculin is the modification of symptoms indicative of systemic intoxication. From the first injection onwards, where dosage has been successfully determined, there is commonly reported by the patient a sense of improvement and even well-being, with a corresponding limitation of constitutional symptoms. The local effect of tuberculin on tuberculous tissues is no less striking. Everyone who has seen the change effected by tuberculin on a local lesion—for example, a gland, preferably a discharging one, or a superficial tuberculosis of mucous membrane or skin—must realize its remarkable influence. The hyperæmia induced in and around the tuberculous focus is conspicuous, and must have something to say in respect of the curative process. Tuberculin has remarkable influence in defining and delimiting tuberculous disease. Its influence is conspicuously conservative. To take examples, I may cite tuberculosis of glands, bones, and joints. Here the effect of tuberculin is conspicuous. Tuberculosis of skin and mucous membrane is likewise readily cured. Tuberculous enteritis is favourably affected. In genito-urinary tuberculosis the results have been remarkably encouraging. In pulmonary tuberculosis much depends on the stage and character of the lesion. The reason for this is twofold: on the one hand anatomical, and on the other physiological.

Anatomically, the process of arrest in tuberculosis is associated with cicatrization. If arrest is to be effective and permanent, cicatrization must be complete. This implies, in the case of pulmonary tuberculosis, corresponding shrinkage of the superficial structure forming the chest-wall. In slighter cases the necessary

shrinkage of the thoracic wall is readily attained. According as the disintegrative process in the lung extends more widely, with production of vomicæ, the chances of shrinkage of the thoracic wall proportionate to the requisite contraction and cicatrization of lung-tissue are progressively lessened. Inevitably there comes a time when intrathoracic disintegration is in excess of possible shrinkage from without. In such a case pulmonary cicatrization will remain incomplete. It is impossible for the ulcerated surfaces to close. Hence, doubtless, in a young subject, whose chest-wall gives freely, treatment is commonly more successful than in the adult patient, with fixed, rigid thorax. From the same cause, probably, it results that pulmonary tuberculosis in the young child often heals spontaneously.

From the physiological side, the limitations to tuberculin may be stated thus : So long as the local process is the main feature—that is, so long as systemic disturbance remains relatively slight—we may anticipate benefit from treatment by tuberculin. On the other hand, with advancing intoxication there comes a time when the introduction of tuberculin ceases to have value, or may do positive harm. Where the system is already soaked with tuberculous toxins, the addition of tuberculin will probably make matters worse. The possibility of activation of leucocytes and bacteriolytic elements no longer exists; the limits of activation have been passed.

While this is so, the curious and interesting observation is sometimes made that, even when recovery seems no longer likely, tuberculin may yet exert important symptomatic influence. Thus I have frequently seen asthmatic manifestations strikingly relieved. The same thing may occur in relation to cough and even haemoptysis. The explanation of this is not quite evident, and cases vary much. It is yet a point of therapeutic value worth remembering.

The above is an excerpt from the "Address on Medicine," delivered before the British Medical Association, July 28, 1909.

FROM FRANCIS M. POTTENGER,

A.M., M.D., LL.D.,

Medical Director of the Pottenger Sanatorium, Monrovia, California; author of "The Diagnosis and Treatment of Pulmonary Tuberculosis."

It is a difficult task to sum up in a few words the present attitude of the medical profession of America toward tuberculin as a diagnostic and therapeutic agent. In the main, however, I believe I am warranted in saying that during the last few years the attitude has changed from that of scepticism, fear, and rabid hostility, to that of not only open-mindedness, but to almost a too general acceptance.

My reason for the latter statement is that, once convinced of its value, the profession is rushing headlong into its use. Men are injecting tuberculin who do not take the time to learn what it is or in what manner it is supposed to act, and whose only knowledge of tuberculosis is the smattering which they have read in some textbook. Such trials are again endangering the usefulness of this remedy, and threatening its future. I would be the last one to advocate that the use of tuberculin be kept in the hands of a few, but one of the first to advocate that it be used only by men who will study it and its action, and familiarize themselves with tuberculosis as we know it to-day, and with the most approved methods of treating it. The injecting of tuberculin is not treating tuberculosis any more than cutting through the abdominal wall and tying off an appendix is operating for appendicitis. Treating tuberculosis is grasping the disease and combating it by all measures that will tend to help the system, build up its defence, such as good food in proper amounts, the regulation of rest and exercise, good habits, hygienic life, and the correction of whatever conditions may be present which are tearing the patient down, as well as the injection of tuberculin. No person suffering from tuberculosis can get well without the presence of tubercle toxins (tuberculin) to stimulate his cells to the production of antibodies. He must either furnish it himself, as he does when the lesion heals spontaneously, or have it furnished artificially, as when the patient recovers under the administration of tuberculin. Neither tuberculin, fresh air, nor the sanatorium are cures for tuberculosis; they are simply aids when used judiciously. It seems strange that so rational a plan as sanatorium treatment should fall into disrepute, but just at present there is a slight reversion of feeling throughout the world against it. The reason is plain. It is the same that endangers tuberculin at the present moment. It is the consideration of the institution and the remedy as the main elements of treatment, when the main factor is the intelligent guidance of the physician who is at the head of the institution, or who administers the tuberculin. It is just as reasonable to expect good results from any man who operates, providing he does it in a hospital, as it is to expect results from any man who treats tuberculosis in a sanatorium; and just as reasonable to expect results from any man who operates, no matter what his qualifications, as it is to expect results from any man who administers tuberculin. The essence of the whole question is *the man*. It is *the man* who operates and produces results; it is *the man* who conducts a sanatorium and obtains results; it is *the man* who administers tuberculin and produces results. While some will be disappointed, and feel that the energy directed toward the cure of tuberculosis as manifested in tuberculin therapy and the sanatorium treatment is misapplied, others, who understand these measures and

the disease, will go on obtaining better and better results. Judged by the total of patients treated, perhaps the results in tuberculosis would be disappointing, the same as the results of operations judged by the totals of all who operate would be disappointing. Judged from the results obtained by the best men, the results are encouraging, the same as the results of operations done by the best men are encouraging.

As to the various tuberculin tests, Von Pirquet's cutaneous test seems to be the favourite. The ophthalmic reaction is not used extensively, because of the disagreeable symptoms produced and the fear of harm. The general opinion is that all of these reactions must be interpreted according to the clinical examination of the patient. A negative reaction when the test has been carefully given is almost absolute proof of the absence of tuberculosis.

With care in administration, the American profession may look forward to an era of great success in the diagnosis and treatment of tuberculosis by the aid of tuberculin.

FROM A. C. INMAN,

M.A., M.B., B.C.H.,

Superintendent of the Laboratories, Brompton Hospital for Consumption and Diseases of the Chest, London.

The selection of cases for any form of treatment constitutes at once one of the most difficult and important problems in medicine. All patients suffering from the same disease cannot be treated alike, nor can it be expected of any form of treatment to accomplish the same result in every case. The evolution of scientific medicine is gradually exterminating the deplorable rule-of-thumb exploitation of certain methods of treatment. Yet, even to-day, the tendency to ignore the advance of science still exists in many quarters, and specific therapy is juggled with, as was its predecessor, the empirical exhibition of temporarily fashionable drugs.

The treatment of pulmonary tuberculosis is no exception to the rule. In the past, most cases have been treated alike, and the only attempt at classifying them has been in reference to the apparent extent of disease as disclosed by physical examination of the chest.

The recent study of the blood as regards the opsonic index,¹ and the study of the temperature-chart in relation to the findings in the blood,² have explained to a large extent the success and failure of past methods of treatment, and suggest a more rational treatment for the future.

¹ *Lancet*, January 25, 1908.

² *Lancet*, October 31, 1908, and Proc. Roy. Soc. Med., 1908, vol. i., No. 6.

These studies have shown that, during the active stages of the disease, the patient is continually inoculating himself with his own "tuberculin"—*i.e.*, tubercle bacilli or their products. So long as fever persists when the patient is kept at rest, these *auto*-inoculations occur spontaneously in an irregular fashion.

The cause of the rise of temperature, which so frequently occurs when an active case is allowed to leave his bed, or over-exerts himself, has been shown to be due to an excessive auto-inoculation, induced by the movements indulged in. Further, the good results obtained by graduated labour, as practised at the Frimley Sanatorium by Dr. Paterson,¹ or the graduated walking exercises as advocated by Dr. Walther, of Nordrach, have been explained as being due to appropriate doses of "auto-tuberculin" artificially induced by these exercises. It would then appear that, quite irrespective of tuberculin-therapy, in the usually accepted sense of the word, the physician treating cases of pulmonary tuberculosis always has to deal with "tuberculin." He directs his attention to preventing overdoses of "tuberculin," or attempts to give appropriate doses by carefully graduated movements. Active febrile cases are dealt with by absolute rest, so as to limit, as far as possible, the occurrence of spontaneous excessive auto-inoculations. Afebrile cases are treated by exercises so graduated that at no time is fever produced by an excessive dose of "tuberculin" until the desired goal is reached, when the patient can perform the hardest possible labour without rise of temperature, and has lost his expectoration. Unfortunately, this smooth sequence of stages from febrile to afebrile, and from afebrile to arrest, is only achieved by ordinary treatment in a limited number of cases, and it is in bridging over these stages, or in bringing each one to a satisfactory conclusion, that tuberculin-therapy may be looked to for help.

Active febrile cases do not by any means all react to absolute rest in bed and attention to hygienic methods. The suitable administration of tuberculin to such cases has undoubtedly lowered the percentage of failures in treatment. It must, however, always be borne in mind that when giving tuberculin we are dealing with active immunization; we are appealing to the infected organism to respond to a stimulus. It is, therefore, obvious that a certain degree of responsibility is necessary on the part of the body, and for this reason the physical state and age of the patient, the duration and extent of the disease, must be taken into account when selecting cases for tuberculin-therapy. Very advanced cases of long duration, which have steadily gone from bad to worse, can rarely be expected to respond to tuberculin. In my experience, however, I am disposed to think that tuberculin may be of the greatest value in cases with good

¹ *Lancet*, January 25, 1908.

physique and moderate fever. Such cases may thus be helped past the stage of instability at which they remain stationary, and be put on the road to recovery.

Lastly, when, in spite of all ordinary treatment, the expectoration and tubercle bacilli cannot be got rid of, although otherwise the treatment has been a success, the results obtained by the use of tuberculin at this stage of the disease promise well, and encourage an extended trial. It must not be thought that this article means to disparage sanatorium and drug treatment intelligently applied. Both are essential adjuncts to tuberculin-therapy, the former as a school and hygienic mode of living, the latter in so far as the drug can successfully combat morbid symptoms.

As an example of the usefulness of drugs may be cited the invaluable action of morphine and other sedatives in relieving the distressing cough of pulmonary tuberculosis, which is often responsible for as much movement as is entailed in a five-mile walk. I have seen the temperature fall to normal after the administration of morphia for this too little recognized cause of excessive auto-inoculation. Success will never be achieved by a haphazard administration of tuberculin. The principles of active immunization must always be borne in mind, and advantage be taken of all methods at our command to measure the effect of each inoculation. The impossible must not be expected of the method; nor must the preparation be blamed for all failures. The new tuberculin era is beginning to flourish; it is upon the wise selection of cases and the judicious administration of the drug that its future success must depend.

FROM EGBERT C. MORLAND,

M.D., B.Sc.,

Arosa, Switzerland.

In a recent publication, "Excellency" Koch¹ remarks that now at last tuberculin is coming to be recognized at its true value in diagnosis and treatment, and that this recognition has been largely brought about by our increased knowledge of the mechanism of immunity, and by the opportunity of controlling the action of tuberculin afforded by the determination of the opsonic index and of complement deviation—a generous recognition by the veteran discoverer of the co-operation of other workers on other lines.

The local tuberculin tests have thrown much new light on the incidence of tuberculosis, and, when they have recovered from the

¹ Bandelier and Roepke: Preface to "Lehrbuch der spec. Diagnose und Therapie der Tuberkulose." Third edition. Würzburg, 1909.

discredit due to uncritical enthusiasm and faulty application, will take their permanent place as instruments of diagnosis. With our present knowledge I think both the cutaneous (v. Pirquet) and the conjunctival reactions¹ may be used to establish the existence of a tuberculous lesion, leaving the auto-inoculation test to decide as to its clinical importance. Of the two, the cutaneous deserves the precedence by reason of its extreme simplicity and harmlessness. The conjunctival test is more difficult to carry out, as the tuberculin may be ejected by blepharospasm or diluted to inertness by tears; and the reaction is more uncomfortable to the patient. On the other hand, serious results may, I believe, be entirely avoided by using a 1 per cent. dilution of old tuberculin, and scrupulously avoiding application where any ocular disease is present. Calmette² claims that the conjunctival reaction indicates tuberculous disease which is in actual evolution, and this only. My experience does not bear this out. I may mention the case of two sisters, one of whom, with slight fever and double apical disease, failed to give any reaction on repetition; while the other, in good health and with doubtful signs of scarring at one apex, gave a violent reaction.³ A further drawback to the introduction of tuberculin into the conjunctival sac is that the eye may become sore each time a therapeutic injection of tuberculin is subsequently given.

In the Alpine health resorts there is now hardly a practitioner who does not use tuberculin in some form for treatment. In 77 out of 135 German sanatoria, tuberculin treatment was in use during 1907.⁴ The kind of tuberculin really appears to be of less moment than the manner of its administration; old tuberculin continues to hold its own alongside of the newer preparations. At the same time, I have found that those tuberculins where endotoxins are present, either in the bacterial fragments, as in Koch's emulsion, or as the result of careful extraction, as in Béraneck's preparation, are the most potent in raising the opsonic index.

¹ If this reaction is associated with a name, it should be jointly that of Calmette and Wolff-Eisner.

² Section of Hæmatology and Vaccine-Therapy, British Medical Association, July 29, 1909.

³ The reactionless sister was doubtless one of those unsatisfactory cases in which the lesion has failed to call forth any immunizing response. The opsonic index was low, and no trace of thermo-stable opsonin was present. Progress began to be made after a few doses of Béraneck's tuberculin.

⁴ *Jahresber. d. deutsch. Zentralkom. z. Bekämpf. der Tuberkulose*, 1908.

FROM CLIVE RIVIERE,

M.D., F.R.C.P.,

Senior Assistant Physician, East London Hospital for Children, Shadwell; Physician to Out-Patients, City of London Hospital for Diseases of the Chest, Victoria Park.

Tuberculin is at the same time our most dangerous and most valuable drug. In the hands of the experienced wonders may indeed be achieved, but woe betide the patient who is tuberculinized by the unskilful. In the first place, the individual and his power of reacting must be considered ; in the second place, his infection, whether localized or accompanied by marked symptoms ; in the third place, the dosage and its most suitable spacing has to be determined. These points need experience, and in my opinion this can only be safely and intelligently acquired by a study of cases controlled by the opsonic index. With such a training, tuberculin may be administered in most cases with only such guidance as can be obtained by clinical observations. Nevertheless, I confess that personally I can still obtain better and more certain results in cases where I have the index (at any rate occasionally) as a guide. Localized tubercle is the form which is especially suitable for tuberculin treatment, and childhood supplies the vast majority of such cases. Tuberculous dactylitis, tuberculous abscesses or adenitis, tuberculous joint lesions—all belong especially to the period of childhood. Tuberculosis of more widespread distribution may also be attacked with success, and it is in this class of case especially that the knowledge of the operator tells. Abdominal tuberculosis of children and phthisis belong to this class, and the more generalized the lesion the more the need for skill and judgment.

In diagnosis tuberculin has supplied us with a weapon of positive but uncertain value. The ubiquity of the tubercle bacillus is such that but few of us escape some attack, and a "reaction" to tuberculin, whether of subcutaneous or conjunctival application, is no uncommon thing in the apparently healthy. On the other hand, the advanced tuberculous may refuse to react ; his tissues are sophisticated ! In spite of these apparent anomalies, tuberculin is of diagnostic value, and especially of negative value, in the hands of the astute physician.

FROM DAVID LAWSON,

M.A., M.D., F.R.S.E.,

Medical Director, Nordrach-on-Dee Sanatorium, Banchny.

It is no longer open to doubt that the publication of the claims put forward on behalf of the opsonic index, in relationship to the diagnosis or exclusion of tuberculosis, has been followed in some quarters by its employment on lines which do not appreciably differ from methods of quackery.

A single, or at most two, opsonic estimations have, in the hands of some, been considered sufficient ground to exclude the presence of tuberculosis, because the examination showed readings within the normal limits between 0·8 and 1·2. As well might we exclude typhoid fever because we happen on two consecutive days to find the patient's temperature standing at 98·4 F. To be of real value in a doubtful case the blood ought to be taken at the same hour daily for a period of a week, and a curve worked out just as is done in making careful temperature records. When this is done, then, as an element in diagnosis, the opsonic index is of undoubted value.

Similarly, when made regularly during the period of administration of tuberculin—as has now been my regular custom for nearly six years—opsonic estimation enables us to get the best result in tuberculin-treated cases. Latterly I have not applied tuberculin to cases of pulmonary tuberculosis in the first instance. Where patients have tended to get well by open-air methods *per se*, I have been content to leave well alone, and dispense with tuberculin. But there is a certain type of case in which recovery proceeds up to a certain point, and then matters seem to hang fire. It is in such cases where tuberculin treatment has been added that I have seen the most strikingly beneficial results follow its administration. Used in this way, I am convinced that a large number of complete recoveries have been secured which otherwise would not have been attained had sanatorium measures pure and simple not been supplemented by tuberculin treatment.

My experience of tuberculin, applied to cases of pulmonary tuberculosis in which fever, however slight, is present, is unfavourable.

FROM F. RUFENACHT WALTERS,

M.D., M.R.C.P.,

Medical Director of the Crooksbury Sanatorium; Author of "The Sanatorium Treatment of Consumption."

There has recently been a disposition in some quarters to regard auto-inoculation by graduated exercises as all-sufficient in the treatment of phthisis, and tuberculin as unnecessary, if not actually harmful. Ten years' experience in the management of a sanatorium has, however, convinced me that there are many cases which cannot be cured by hygienic measures alone, and that some of these may be restored to health if tuberculin is also employed. In some cases fever is set up directly the patient sits up in bed, or attempts the slightest exertion ; and here a series of tiny progressive doses of tuberculin—*e.g.*, $\frac{1}{200000}$ milligramme T.R. and upwards—will set going the immunizing machinery until graduated exercise is possible. In other

cases, owing to the isolation of the tuberculous masses by fibrosis, no auto-inoculation takes place, and the immunizing mechanism is insufficiently stimulated, although the lesions are not healed, and the patient remains liable to periodical haemoptysis or slight indisposition from time to time, or to more serious relapses. In these cases progressive doses of tuberculin (say from $\frac{1}{80000}$ milligramme to $\frac{1}{300}$ milligramme, T.R.) will raise the resisting-power and prevent relapses. The dose need not raise temperatures; on the contrary, a suitable dose will often reduce the temperature to normal in a slightly febrile patient. A "temperature reaction" is the consequence of a dose which may be indicated for diagnosis, but is unnecessarily large for curative purposes.

FROM GEORGE A. CRACE-CALVERT,

M.B.,

Medical Director of the Vale of Clwyd Sanatorium, Ruthin.

I have used tuberculin during the last four years in the treatment of pulmonary tuberculosis in sanatorium patients, and believe that in proper cases it is a most valuable remedy. I have given it both hypodermically and orally, and though I think that the former is preferable, I am using the latter to a fair extent, for, though with the hypodermic method one gets a more pronounced effect, there is often a bigger preliminary reaction. In chronic cases, or those which have stopped making any progress, it certainly helps towards arrest of the disease. In acute cases it must be used with great caution, as there is much auto-inoculation taking place; but lately I have been giving a small quantity, say, $\frac{1}{10000}$ milligramme, divided into twelve doses, three times a day before meals, and it seems to have had the effect of causing the temperature to drop, whilst the number of bacilli in the sputum has also decreased. I seldom use it in early cases, as they usually do well without. Usually the cough and expectoration are decreased (occasionally increased for the first few days), and weight goes up. I have used it in several cases of tuberculous nephritis and cystitis with good effect. I have not used it for diagnostic purposes.

INSTITUTIONS FOR THE TUBERCULOUS.

WHITE HAVEN SANATORIUM.

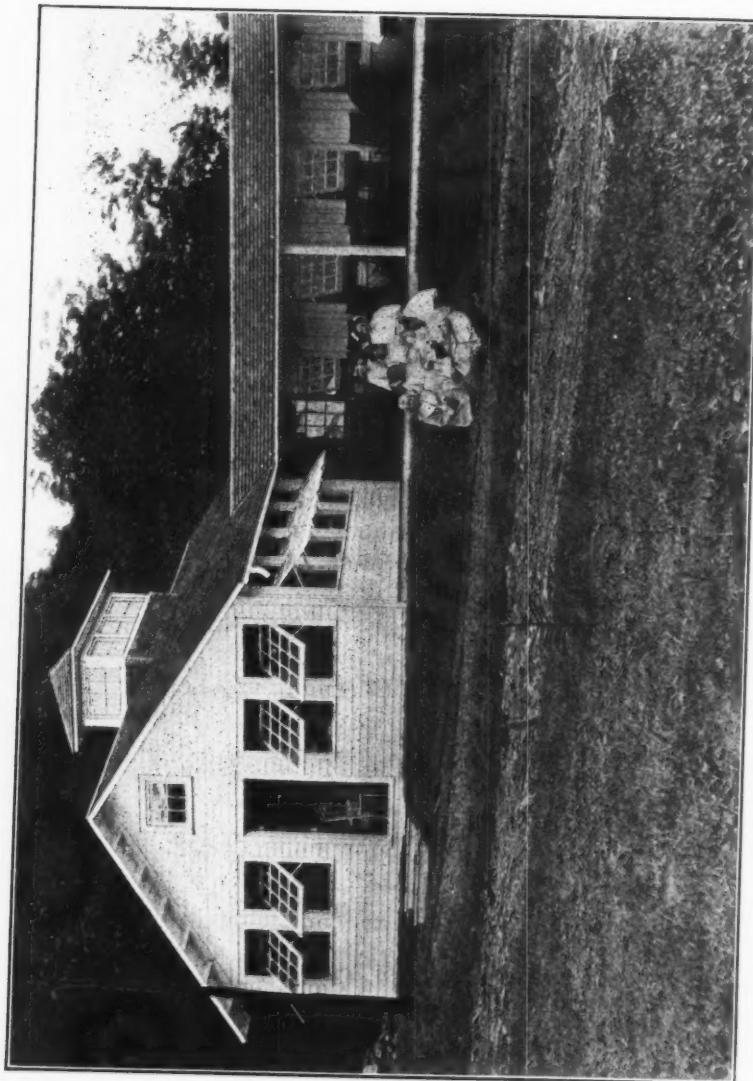
WHITE HAVEN SANATORIUM was opened on August 8, 1901. White Haven is a town of about 1,500 inhabitants, 116 miles from Philadelphia, and situated at an elevation of 1,600 feet. The sanatorium is managed by a private corporation known as "The Free Hospital for Poor Consumptives and White Haven Sanatorium Association." The estate comprises 230 acres on a mountain-side, protected on the north-west. The buildings consisted originally of a small farmhouse and a large barn; the barn was converted into a pavilion, with a capacity of thirty-two beds, and the farmhouse was equipped with cooking and dining-room facilities for a fair-sized sanatorium. In 1902 three brick cottages were erected, each with a capacity of sixteen beds. Since then thirteen other buildings, all frame, have been erected, making the total capacity at present 211 beds. In addition to the patients' quarters there is a superintendent's cottage, and also a light and heat plant, a hot-house, a chicken-farm with 4,000 chickens, and a complete water-plant. Since its foundation the sanatorium has treated on an average 429 patients per year. The regular charges are seven dollars per week, except in what is known as Department No. II., for slightly more advanced cases, where the charges are nine dollars per week. When patients are so improved that they can exercise with benefit, the exercise is given in the shape of work in connection with the sanatorium. The work is gradually increased up to eight hours a day, and the patients are expected to remain until they have worked eight hours a day for one month. Practically all the work about the sanatorium is done by patients. The sanatorium is intended primarily for incipient cases, but only 26 per cent. are of this class. The following are the results regarding 2,574 patients who remained over one month:

Result.		No. of Cases.	Percentage.
Disease arrested	...	737	28·6
Much improved	...	621	24·1
Improved	...	969	37·6
Not improved	...	226	8·7
Died	...	21	0·8



WHITE HAVEN SANATORIUM : BIRD'S-EYE VIEW.

WHITE HAVEN SANATORIUM : PORTION OF CHILDREN'S SHACK.



Of 332 patients who remained in the sanatorium more than three months previous to February, 1907, and who have been kept track of, the following are the results :

Condition on Discharge.	Present Condition.		
	Well.	Living.	Dead.
Disease arrested ... 140	59 (42 %)	62 (44 %)	19 (14 %)
Much improved ... 108	25 (23 %)	32 (30 %)	51 (47 %)
Improved ... 73	10 (14 %)	16 (22 %)	47 (64 %)
Not improved ... 11	1 (9 %)	0 (0 %)	10 (90 %)
Grand totals ... 332	95 (29 %)	110 (33 %)	127 (38 %)

JOSEPH WALSH, M.D.,
Chairman of the Medical Administration Committee.

THE LIVERPOOL SANATORIUM.

The Liverpool Sanatorium for Consumption, which is situated on the outskirts of Delamere Forest, is connected with the Mount Pleasant Hospital for Diseases of the Chest, Liverpool, and forms part of a comprehensive scheme for the treatment of tuberculosis. It occupies an excellent well-wooded site at a level of 500 feet above the sea. From the grounds there is to be seen, on a clear day, one of the finest and most extensive views in the North of England. The sanatorium was among the first in the country to be erected by private philanthropy, the foundation-stone being laid by the late Earl of Derby in October, 1900. It was presented conjointly, as an adjunct to the Mount Pleasant Hospital, by the late Lady Willox and by Sir William P. Hartley, of Aintree, who takes a very active and helpful interest in the work of the institution. Admission to the sanatorium is restricted for the most part to patients resident in Liverpool and district. The main block, which faces south-west, is built of brick, and lays claim to some architectural beauty. It provides accommodation for eighteen female patients, in addition to the staff. The bedrooms, with one exception, are single rooms of large size and pleasing outlook. They have a window-surface extending the whole width of the room, which, with the open door and fanlight above, provides a cross-ventilation that leaves nothing to be desired. Accommodation for twenty-two male patients is provided by five wooden bungalows, which have been erected amongst the pine-trees to the west of the main building. Treatment includes the usual hygienic and dietetic measures. Special attention is paid to treatment by auto-inoculation, induced by graduated walking exercise and manual labour. Inoculations with Koch's new tuberculin are given in suitable and selected cases. The patients selected are those who have passed



MAIN BUILDING OF THE LIVERPOOL SANATORIUM.



MEN'S BUNGALOWS OF THE LIVERPOOL SANATORIUM.

the various grades of walking exercise and manual labour without any reactive auto-inoculation. The initial dose of tuberculin is $\frac{1}{4000}$ milligramme, and it is gradually increased by weekly inoculations until $\frac{1}{100}$, $\frac{1}{50}$, or $\frac{1}{10}$ milligramme (maximum) is reached. Up to the present fifty cases have been treated by this new combined method, and the results obtained have been excellent.

The importance of the educational influence in the campaign against tuberculosis, more especially as a factor in minimizing the risks of relapse, is insisted upon. At intervals a course of lectures is delivered to the patients on important personal aspects of the tuberculosis problem. A careful record of the subsequent history of all old patients is kept in a special register. Patients when discharged are supplied with a schedule of information containing particulars as to their progress, and recommendations regarding future treatment.

H. HYSLOP THOMSON, M.D.,
Resident Medical Superintendent.

THE ASHOVER SANATORIUM.

The Ashover Sanatorium stands half a mile from the village of Ashover in Derbyshire at an altitude of 600 feet, surrounded by private



ASHOVER SANATORIUM.

parkland, and has a large kitchen-garden and orchard. It has a south aspect, and is well sheltered on the north and east sides, and commands a fine view over the valley of the Amber. The soil is porous mill-

stone grit, and the water-supply (which is private) is good and abundant. The drainage is on the water-carriage system, and is separate from that of the village.

The sanatorium is lighted throughout by acetylene gas. Special care is given to the nature of the food. The quantity is regulated as far as possible by common sense, and by the individual requirements of each patient.

Special rooms are reserved for non-tuberculous cases. The terms are £3 3s. to £5 5s. weekly, according to the room occupied and the nature of the case.

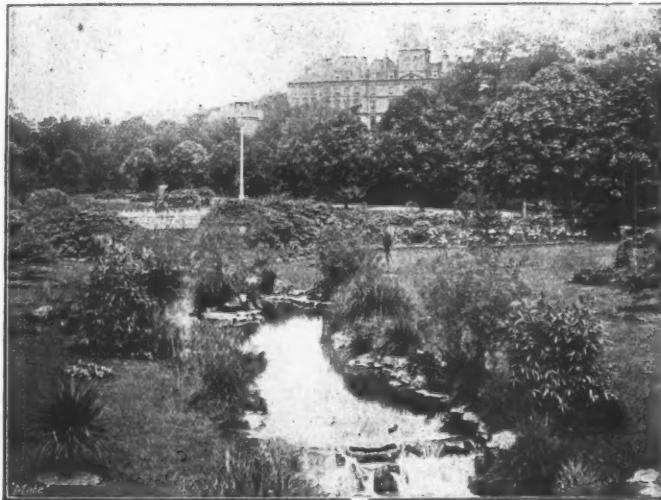
Ashover can be reached by the Midland Railway from Chesterfield (7 miles), Stretton ($3\frac{1}{2}$ miles), or Matlock (4 miles). Conveyances from Ashover meet all trains at Stretton, and special arrangements can be made to meet patients at any of the other stations.

IDA E. FOX, M.D.,
Medical Superintendent.

HEALTH STATIONS.

BOURNEMOUTH.

BOURNEMOUTH is built on a sandy subsoil, the dry and porous nature of which makes it an ideal formation from the hygienic standpoint. Sheltered to the north and the east, and wooded with pines and deciduous trees to such an extent that it is in reality a forest city, Bournemouth has an equable temperature throughout the year. The mildness of its winter is well known, but there is some amount of misconception concerning its summer climate. The fresh sea-breezes passing inland along the open chines, and the luxuriant foliage and the tree-shaded



UPPER PLEASURE GARDENS, BOURNEMOUTH.

walks of the town, combine to make the place a health and holiday resort almost as acceptable in summer as it is in winter. The area of the county borough is exceptionally large relative to the number of houses and inhabitants; and because it offers an unusual variety of climate—wood and sea, cliff and valley—it is suitable for the treatment of patients suffering from a very wide range of ailments. The experience of medical men during the past fifty years has shown that Bournemouth is most suitable for patients suffering from diseases

of the respiratory and of the nervous system. Early cases of tuberculosis do well, but it is becoming less usual to send advanced cases of pulmonary tuberculosis. The climate has a markedly beneficial effect on cases of chronic bronchitis and of chronic renal disease, and also in most cases of asthma, both of the neurotic and of the catarrhal type ; and its value in the treatment of disease of the nervous system,



PINE WALK, BOURNEMOUTH.

particularly the functional type, is becoming more and more widely appreciated. The climate is found to be most suitable for the mild neurasthenic attacks of people who have been overworked in profession or business, and its sedative effect on the nervous system is valuable in cases of insomnia.

A. D. EDWARDS, M.B., B.S., B.Sc., D.P.H.,
Deputy Medical Officer of Health.

NOTICES OF BOOKS.

OPEN-AIR TREATMENT OF CONSUMPTION.

DR. BURTON-FANNING's little handbook to the open-air treatment of pulmonary tuberculosis,¹ four years after its first appearance, has reached its second edition. It is the best work of the kind with which we are acquainted. Excepting in his advocacy of mouth-temperatures, which most physicians who have had practical experience of open-air life consider to be unreliable, the author's views and directions would be endorsed by nearly all who know the subject. Very little reference is made to the limitations of fresh-air treatment, to the different forms of tuberculin therapy, or to the drugs from which help may be expected ; this may, however, have been regarded by the author as outside his subject. The book contains a brief reference to Wright's opsonic test, the theory of auto-inoculation, and the Frimley system of graduated labour, and gives interesting details as to the methods and results at the Mundesley and Kelling Sanatoria.

F. R. WALTERS, M.D.

THE ARREST OF TUBERCULOSIS.

Professor S. Adolphus Knopf is not only a physician, but a pioneer and a prophet. He anticipates and labours for the extinction of tuberculosis. His latest work² claims to be an exposition of "modern methods for the solution of the tuberculosis problem." The volume is the best of recent works dealing with the subject in its medico-sociological aspects, and should be studied by medical practitioners, patients, sanitarians, and all interested or engaged in the campaign against tuberculosis. The work is that of a long-experienced and judicious expert, and is addressed to all sorts and conditions of workers for the public welfare. It is impossible in a short notice to indicate the wide scope, clear insight, and sound judgment, displayed. Truths are presented in crisp and gripping phrase, and throughout the language is clear-cut and telling. Numerous illustrations add much to the attractiveness and value of Dr. Knopf's masterly work. A word of praise must be permitted to the publishers for the excellent get-up of the book. Every student of tuberculosis should possess this volume.

T. N. KELYNACK.

¹ "The Open-Air Treatment of Pulmonary Tuberculosis," By F. W. Burton-Fanning, M.D., F.R.C.P. Second edition. Pp. 184. London : Cassell and Co., Ltd. 1909. Price 5s.

² "Tuberculosis: A Preventable and Curable Disease." By S. Adolphus Knopf, M.D. Pp. 394. With 115 figures. New York: Moffat, Yard and Co. 1909. Price \$2.

THE RÔLE OF THE DOCTOR.

In "Der Arzt,"¹ Dr. Fürst has provided a work which may well be studied by doctors and laymen of every nationality. This book is No. 265 of the series "Aus Natur und Geisteswelt," published by B. G. Teubner, Leipzig. This excellent series of monographs caters for the educated layman who wishes to gain accurate knowledge of matters outside of his own particular groove. Dr. Moritz Fürst has aimed at giving a graphic presentation of the manifold aspects of the medical profession in Germany, of the intimate part it plays in the development of the social politics of the nation, and of the training that is essential for such a responsible and altruistic vocation. Tolstoy's words are peculiarly applicable to the man who wants to be a doctor : "If you feel no love, sit still ; occupy yourself with things, with yourself, with anything you like, only not with men." Dr. Fürst regards the doctor as something more than a mere curer of disease. He is a practical factor for the amelioration of social conditions which militate against the national health. The curative measures should carry with them educational forces. He considers it essential that the sanatorium doctor should be thoroughly versed in architectural hygiene, and highly desirable that he should have a voice in the planning of such institutions. The sanatorium should be a temple where healthy doctrines are inculcated in such a convincing manner that their permanent adoption by outgoing patients should follow quite naturally. The book is written in clear, crisp German, and can be readily understood. Every department of German medical activity is very shortly and admirably dealt with, and the little volume should prove interesting and instructive to foreign readers, as well as to the German public to whom it is addressed.

EMILIA V. DE VOSS.

ANTI-TUBERCULOSIS WORK IN SWEDEN.²

Sweden has honourably won a foremost place amongst progressive peoples in the conflict with tuberculosis. All students of the subject will therefore welcome the series of papers published under the title "Festkrift vid Tuberkulos-Konferensen," for the recent International Tuberculosis Conference held in Stockholm this year. These present lucid and well-written accounts of the progress of the Anti-Tuberculosis campaign in Sweden. The volume will prove of special interest to those engaged in the conduct of practical preventive measures designed to combat the disease. An eminently readable article by Dr. B. Buhre, the energetic secretary of the Swedish Anti-Tuberculosis Association, sketches the growth of his organization, which, founded in 1904, under the chairmanship of Baron Gustaf Tamm, has now over 22,000 members—a proportion of one member to every 241 inhabitants. The paper entitled "Quelques Mots au Sujet des

¹ "Der Arzt: Seine Stellung und seine Aufgaben im Kulturleben der Gegenwart. Ein Leitfaden der Sozialen Medizin" [The Doctor: His Place and his Functions in the Social Life of To-day. A Guide to Social Medicine]. By Dr. Moritz Fürst, of Hamburg. Pp. 142. Leipzig: B. G. Teubner. 1909. Price 1 mark; bound in linen, 1 mark 25 pfennig.

² "Festkrift vid Tuberkulos-Konferensen." Stockholm: Published by the Swedish Government, 1909.

"Sanatoriums du Fonds Jubilaire," by Professor Edgren, explains the genesis of the sanatoria founded at Hålahult, Österås and Hessleby, briefly describes their structure, and gives a careful and valuable analysis of the results which have been obtained there. Dr. Sture Carlsson contributes a short but very complete account of the Institutions at present existing in Sweden for the treatment of tuberculosis. The most striking fact revealed by this paper is the remarkable co-operation and assistance rendered by Sovereign and State in all measures calculated to diminish or stamp out the tuberculous scourge. Drs. Lundberg, Kjellin, and Karlsson are joint authors of a valuable statistical paper on the frequency of pulmonary tuberculosis in the primary schools of Stockholm. Dr. Neander contributes an account of comprehensive and national measures undertaken to treat and prevent tuberculous disease in an infected district, which might well form a model for similar efforts in our own country. There are other papers of considerable interest from Dr. Regner and Dr. Waage. The volume is a striking illustration of what may be accomplished by co-operation and co-ordination.

H. J. GAUVAIN.

A SYSTEMATIC WORK ON RESPIRATORY AFFECTIONS.

Dr. Samuel West's two-volumed "Treatise on the Etiology, Pathology, Symptoms, Diagnosis, Prognosis, and Treatment, of Diseases of the Lungs and Air-Passages" will be welcome in its second and revised edition, for it is the most complete and helpful modern systematic work which we possess on diseases of the respiratory system.¹ It is a treatise which should be in the possession of every practitioner. While so much in these large, well-printed, and profusely illustrated volumes is praiseworthy, we regret to have to express our disappointment with the section devoted to tuberculosis of the lungs. Why Dr. West should persist in clinging to the antiquated, unsatisfactory, and now generally discarded designation "phthisis" we cannot understand. The pathology and symptomatology are well presented, but the sections on treatment leave much to be desired, especially those dealing with the use of tuberculin. The best opinions of to-day certainly do not support the author's contention that "it seems probable, therefore, that so far as phthisis is concerned, the ultimate verdict on T.R., even with the help of the opsonic index, will be the same as that passed on the old tuberculin." Dr. West seems to manifest a prejudice against sanatoria when he states that "some sanatoria go so far as to regard any cases with definite physical signs, even if slight, as unsuitable": of such in this or other lands we have never heard nor read. The author seems to have had no practical experience regarding the important recent work on graduated exercise as a means of treatment, for he says: "Dr. Paterson has introduced at King Edward's Sanatorium a system of graduated labour." We had thought that all the world recognized that Dr. Paterson's pioneer work was conducted at the

¹ "Diseases of the Organs of Respiration." By Samuel West, M.A., M.D., F.R.C.P., Physician and Lecturer on the Principles and Practice of Medicine at St. Bartholomew's Hospital. In two volumes. Second edition, revised. Pp. 958. London: Charles Griffin and Co., Ltd. 1909. Price 36s. net.

Brompton Hospital for Consumption Sanatorium at Frimley. There are many other matters which invite criticism, and we cannot but conclude that Dr. West, in justice to himself as well as to the subject of pulmonary tuberculosis, would do well to bring this portion of his valuable treatise thoroughly up-to-date, and issue it as a separate volume.

SANATORIUM TREATMENT OF CONSUMPTION.

Dr. Walters has supplied a real need by the issue of his well-conceived and admirably executed manual on open-air management of consumptives.¹ By an ingenious division of his work into two parts he has provided guidance for the patient and his friends, and direction for the physician responsible for the medical supervision of the case. The volume is one which should be studied by both medical and lay students of the tuberculosis problem. It is a concise, reliable, informing, and thoroughly up-to-date handbook regarding all matters relating to the hygienic treatment of consumptives in sanatoria or under open-air conditions. Dr. Walters writes from exceptional experience and with a wide and unprejudiced outlook; his style is clear and incisive, and yet the subject-matter throughout is scientifically expressed. Medical superintendents of sanatoria will find the book invaluable. The sections on diets, symptomatic treatment, and the employment of so-called specific methods, are deserving of special praise. To all interested in the care of the consumptive, only one advice is possible in regard to this notable volume—Get it.

THE PROBLEM OF IMMUNITY.

Among recent studies on immunity, serum-therapy, and like specific forms of treatment, Dr. D'Este Emery's scholarly work must be allowed a foremost place.² It affords a connected and eminently scientific exposition of the chief facts definitely known to us regarding the methods by which the body protects itself against infections; and it lucidly indicates the practical means whereby such knowledge can be usefully employed in diagnosis, prophylaxis, and treatment. The work calls for close study, and is a monument to painstaking industry and patient research. The section dealing with tubercle is comparatively short, but provides a judicious and helpful presentation of what is known concerning local and general immunity to tuberculosis. Details are given respecting the tuberculin reaction and the opsonic index. As to the use of small doses of tuberculin without opsonic or other control, the opinion is expressed that "this combines the advantages of practicability and safety, and often gives good results." It is impossible to speak too highly of this volume; the bibliography alone will make it invaluable to all students.

¹ "The Open-Air or Sanatorium Treatment of Pulmonary Tuberculosis." By F. Rufenacht Walters, M.D., B.S., M.R.C.P., F.R.C.S., Physician to the Crooksbury Sanatorium; formerly Physician to the Mount Vernon Hospital for Consumption and Diseases of the Chest. Pp. 323. London: Baillière, Tindall and Cox. 1909. Price 5s. net.

² "Immunity and Specific Therapy." By W. D'Este Emery, M.D., B.Sc., Clinical Pathologist to King's College Hospital and Pathologist to the Children's Hospital, Paddington Green. Pp. 448. With illustrations. London: H. K. Lewis 1909. Price 12s. 6d. net.

THE GRAPHIC STUDY OF CARDIAC LESIONS.

Dr. John Hay of Liverpool has placed clinicians under a deep debt of gratitude by the publication of his succinct and practical handbook on modern graphic methods of investigating cardiac cases.¹ His well-conceived and admirably-executed monograph serves as a reliable guide to a peculiarly perplexing and intricate subject. Very properly, Dr. James Mackenzie furnishes the introduction. Opening with a description of the myogenic theory of the heart's activity and certain anatomical considerations, the author passes at once to a description of instruments, the clinical polygraph and the ink-writing polygraph, which is followed by a study of normal records of cardograms and phlebograms. The auricular type of venous pulse is then described and discussed, and following chapters deal with the extrasystole, the ventricular or nodal form of venous pulse, and various disturbances in cardiac function. There is much need for a study of cardio-vascular conditions in tuberculous subjects, and we particularly commend this volume to residents and others in connection with sanatoria who are desirous of undertaking important and much-needed clinical research work.

THE PROTECTION OF CHILDHOOD.

Dr. David Forsyth's new book is a model study of child-life.² Of all the many works recently issued on this all-important subject, none surpass it in lucidity, outlook, and scientific precision. It is eminently sane and free from all suggestion of fads, and will be invaluable to educationalists, both medical and lay, as a rational guide to all matters concerning childhood. Every parent and school doctor should procure this volume. The sections on tuberculosis are reliable and informing. The author recognizes the importance of securing greater protection from this scourge. He does not, as some have foolishly done, seek to discount the importance of evidence pointing to the frequent occurrence of tuberculosis in school children, but wisely urges that, "pending the collection of more inclusive statistics, we should be imprudent to underestimate the incidence of a disease which is known to be one of the greatest scourges in the years before and after schooling." He shows that "the principal dangers, so far as schools are concerned, come from three directions : (a) From dirty schoolrooms; (b) from other children already affected; (c) from tuberculous teachers or other officials." Dr. Forsyth shows that the mortality returns from tuberculous disease in children (4·92 in 1906 and 4·54 in 1907) are to be viewed as underestimates. Investigation of cases dying at the Evelina Hospital leads him to conclude that "12 per cent. more nearly represents the real mortality from tubercle than does 5·17 per cent.; but even this higher figure—as, indeed, all computations of the infant mortality from tubercle—underestimates the frequency with which life is destroyed by tuber-

¹ "Graphic Methods in Heart Disease." By John Hay, M.D., M.R.C.P. Pp. 184. With 128 figures. London and Oxford : Henry Frowde, and Hodder and Stoughton, "Oxford Medical Publications." 1909. Price 5s net.

² "Children in Health and Disease: a Study of Child-Life." By David Forsyth, M.D., D.Sc., Physician to the Evelina Hospital for Sick Children. Pp. 362. London: John Murray. 1909. Price 10s. 6d. net.

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³ "Symptoms and their Interpretation." By James Mackenzie, M.D., M.R.C.P. Pp. 297. London: Shaw and Sons, 7 and 8, Fetter Lane, E.C. 1909. Price 7s. 6d. net.

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³ "The Causation of Sex: A New Theory of Sex, based on Clinical Materials, together with Chapters on the Forecasting of the Sex of the Unborn Child, and on the Determination or Production of Sex at Will." By E. Rumley Dawson, L.R.C.P., M.R.C.S. Pp. xii, 196. With 21 illustrations. London: H. K. Lewis. 1909. Price 6s. net.

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the author has started his researches with hypothesis, rather than allowed conclusions to be the outcome of unbiased investigation. The book has clearly entailed much labour and research, and is certainly full of interest for all actual or potential parents, as well as for physicians. We still are of opinion that the causation of sex in mankind remains "on the borderland of the insoluble."

Probably every practitioner has felt the need for a concise description of simple and effective breathing exercises, which might be handed to parents, teachers, or nurses, and be suitable for use in the home, the school, and the sanatorium or hospital. To such we commend the admirable tract prepared by Dr. D. M. Mackay.¹ If the author would bring out a new and illustrated edition, it would meet the needs of many school doctors, and be of service to those conducting open-air schools and other establishments for children.

Many popular works on consumption are now appearing, and do good service in arousing the attention of the public to the necessity of adopting preventive measures against the scourge of tuberculosis. Dr. N. S. Davis has prepared a practical little manual on "The Ways of Preventing Consumption, and of Guiding those who have it to Recovery." It is a reliable guide to hygienic living, and will be of service in helping the intelligent to help themselves.² There is a chapter on "Sanatoria and Other Institutions for Consumptives." Although written primarily for American readers, it deserves to be known in this country.

A new edition of Dr. H. Aubrey Husband's little "Pocket Prescriber," much beloved of students, has just appeared.³ It contains 397 prescriptions, much useful information respecting weights and measures, and an index of diseases.

Dr. Jamieson B. Hurry, President of the Reading Pathological Society, has sent us an elegantly printed copy of the historical records of "one of the oldest medical societies in this country."⁴ The preparation of this handsome volume has evidently been a labour of love, of which the compiler may be justly proud.

Dr. W. J. Tyson, of Folkestone, has collected into one little volume an attractive series of sketches of clinical experiences, opinions, and suggestions, which, coming from a much-respected physician, will be read with interest by a wide circle of friends.⁵

The Thresh Disinfecter Company have just issued an elegantly

¹ "Breathing Exercises for Use after Removal of Post-Nasal Growths (Adenoids)." By Duncan Matheson Mackay, M.D., Senior Clinical Assistant, the Hospital for Diseases of the Throat, Golden Square. Pp. 4. London: John Bale, Sons and Danielsson, Ltd. Price 1d. each; per dozen, 1s.; per 100, 7s. 6d.

² "Consumption: How to Prevent it, and How to Live with it: its Nature, its Causes, its Prevention, and the Mode of Life, Climate, Exercise, Food, Clothing, necessary for its Cure." By N. S. Davis, A.M., M.D., Professor of Principles and Practice of Medicine, North-Western University Medical School. Second edition. Pp. 172. Philadelphia: F. A. Davis Company. 1908.

³ "The Student's Pocket Prescriber." By H. Aubrey Husband, M.B., C.M., B.Sc., F.R.C.S.E. New edition. Pp. 175. Edinburgh: E. and S. Livingstone. 1909.

⁴ "A History of the Reading Pathological Society." By Jamieson B. Hurry, M.A., M.D. Pp. 179. With illustrations. London: John Bale, Sons and Danielsson, Ltd. 1909. Price 7s. 6d. net.

⁵ "Notes and Thoughts from Practice." By W. J. Tyson, M.D., F.R.C.P., F.R.C.S., Hon. Physician, Victoria Hospital, Folkestone. Pp. 95. London: John Bale, Sons and Danielsson, Ltd. 1909. Price 2s. net.

printed and illustrated volume dealing with disinfectors, sprayers, vaporizers, and sterilizers. Professor Sheridan Delépine contributes an article on "The Essentials of Disinfection and Sterilization by Steam," and Professor G. Sims Woodhead furnishes Reports on the "Thresh" and "Delépine-Jones Current Steam Disinfectors." Medical officers of health and sanitarians generally should procure a copy of this scientifically designed monograph-catalogue.¹

A simple, practical handbook on milk-testing has been prepared by Mr. C. W. Walker-Tisdale, F.C.S., well adapted to the requirements of medical practitioners and others interested in the maintenance of a pure milk-supply.²

Dr. George Pernet's thesis for the Paris Doctorate of Medicine is an able study of a rare and obscure cutaneous affection. Its carefully selected bibliography will be of service to dermatologists.³

Medical practitioners are constantly called upon to advise in the selection of health and holiday resorts. Two excellent series of artistic and reliable handbooks to British health stations may be recommended to their attention. Messrs. Arthur Doubleday and Co. are issuing a number of small, elegantly printed, and well-illustrated manuals as "official publications" for a number of well-known places.⁴

Mr. Edward J. Burrow is also publishing a collection of "Borough Pocket Guides."⁵ The copies which we have seen are most attractive in get-up, well printed, and lavishly illustrated, while the text seems all that could be desired. They are just the right size for the pocket.

"The Homeland Association" have done patriotic work by the publication of seventy-seven volumes descriptive of the beauties and benefits of various districts of England and various reference books. The latest of these really national literary topographical guides is a handbook to the centres in Dorset, Somerset, Devon, and Cornwall, which are in connection with the London and South-Western Railway.⁶

The Health Resorts Development Association are also doing good work for British Health Stations by the issue of an excellent series of well-illustrated local guides, which may be obtained on application to the town clerks of the places to which they relate.⁷

Open-air livers who are also disciples of Isaac Walton will be thankful to know of the little illustrated guide to angling centres on

¹ "Disinfectors, Sprayers, Vaporizers, Sterilizers." Pp. 65. London: The Thresh Disinfecter Company, Ltd., Brook House, 10 to 12, Walbrook, E.C. 1909. Price 2s.

² "Milk Testing: A Simple Practical Handbook for Dairy Farmers, Estate Agents, Creamery Managers, Milk Distributors, and Consumers." By C. W. Walker-Tisdale, F.C.S. Pp. 78. With illustrations. Northallerton: W. R. Smithson. 1909. Price 1s. net.

³ "Le Lupus Erythematous Aigu d'Emblée: Étude Clinique." Par Le Docteur George Pernet. Pp. 135. Paris: Jules Rousset, 1, Rue Casimir-Delavigne. 1908.

⁴ Messrs. Arthur Doubleday and Co., Ltd., 8, York Buildings, Adelphi, London, W.C., will send list of their handbooks on application.

⁵ Mr. Edward J. Burrow, Midland Bank Chambers, Cheltenham, will furnish a list, on application, of "Borough Guides" to over 425 towns in this country and on the Continent. Price each, 2d. for English, and 3d. for foreign towns.

⁶ "Where to Stay in the West Country." Edited by Prescott Row. Vol. i., second edition. Pp. 130, with map. The Homeland Association. 15, Bedford Street, W.C. 1909. Price 6d.

⁷ A list of these Guide-books may be obtained on application to the Health Resorts Development Association, 29, John Street, Bedford Row, London, W.C.

the rivers and broads of Norfolk and Suffolk, the waters of the Lincolnshire fens, and the Great Ouse.¹

As a convenient reference work for British health and holiday resorts, Mr. Walter Hill's volume concerning districts served by the main railways is invaluable.²

Dr. John D. Comrie has devised an ingenious chart for instruction in the principles of the clinical examination of the heart.³ By the pulling of tapes, the designations of the physical signs associated with certain diseases are made to appear beneath openings arranged on a large diagrammatic figure of the chest. A descriptive pamphlet accompanies this novel synoptic chart.

OFFICIAL REPORTS AND PERIODICAL LITERATURE.

In the Second Report of "The King's Sanatorium" the Turban-Gerhardt classification of the International Tuberculosis Association has been adopted.⁴ A map of the grounds is given, with a guide to "measured walks," records of cases, and details of the work of the establishment.

The last volume of Transactions of the American Climatological Association contains a number of valuable papers on the climatic and sanatorium management of tuberculosis.⁵ Dr. Guy Hinsdale, the Secretary, contributes a suggestive article on "Graduated Labour in the Treatment of Pulmonary Tuberculosis."

Organizers of Tuberculosis Exhibitions will be well advised to make themselves acquainted with the details of the recent exposition in New York City.⁶

Among new journals likely to interest our readers are two of special value and importance : *Heart*⁷ is devoted to the study of the circulation, and, under the able editorship of Dr. Thomas Lewis, promises to be a notable addition to medical periodical literature ; the *Journal of Pharmacology and Experimental Therapeutics*,⁸ under the direction of Dr. John J. Abel and a brilliant staff of associates, will be of real service to research students and all desirous of furthering knowledge regarding therapeutic measures in the light of modern investigations.

¹ "Guide to Angling Resorts." Pp. 140. Issued by the Publications Department of the Great Northern Railway. 1909. Price 3d.

² "Where to Stay and What to See." London : Walter Hill, 67 and 69, Southampton Row, W.C. 1909. Price 1s.

³ "Synoptic Chart of Cardiac Examination." Arranged by John D. Comrie, M.A., B.Sc., M.B., F.R.C.P.E., Assistant Pathologist, lately Clinical Tutor, Royal Infirmary of Edinburgh. With Manual. Pp. 12. London : John Bale, Sons and Danielsson, Ltd. 1909. Price 2s. 6d. net.

⁴ Annual Report of King Edward VII. Sanatorium, Midhurst. July, 1907, to July, 1908.

⁵ Transactions of the American Climatological Association. Vol. xxiv. Pp. 290. Philadelphia. 1908.

⁶ "Report of the International Tuberculosis Exhibition at New York ; conducted by the Committee for the Prevention of Tuberculosis of the New York Charity Society." 1909.

⁷ Published by Messrs. John Shaw and Sons, Fetter Lane, Fleet Street, London, E.C. Subscription per vol., 20s.

⁸ Published bi-monthly by the Williams and Wilkins Publishing Company, 2,427-2,429, York Road, Baltimore, Md., U.S.A.

PREPARATIONS AND APPLIANCES.

THE TREATMENT OF AFFECTIONS OF THE RESPIRATORY TRACT BY WARM AND MEDICATED AIR.

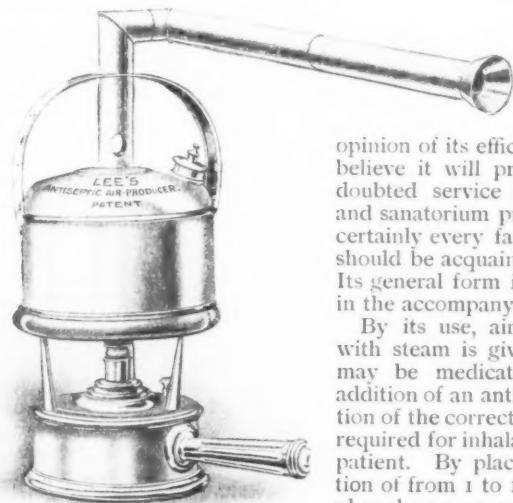
ALL appliances for the local application of heated and medicated air by inhalation have hitherto had serious limitations and defects. Most, if not all, of these have been overcome by the new ANTISEPTIC AIR PRODUCER, invented by Mr. S. Lee.¹ We have recently had an opportunity of testing this apparatus, and have formed

a high opinion of its efficiency. We believe it will prove of undoubted service in hospital and sanatorium practice, and certainly every family doctor should be acquainted with it. Its general form is indicated in the accompanying figure.

By its use, air combined with steam is given off, and may be medicated by the addition of an antiseptic solution of the correct proportion required for inhalation by the patient. By placing a solution of from 1 to 10 per cent. phenol or pure carbolic acid in the water contained in the boiler, a vapour for inhalation containing the phenol in exactly the same proportion

is obtained. Analytical results of the phenol steam have proved this beyond question. The apparatus is based on the "Lister" principle of antiseptics. Mr. Lee's appliance provides for the supply of

¹ Full particulars regarding the Antiseptic Air Producer may be obtained on application to the patentee, Mr. S. Lee, 51, Conduit Street, London, W.



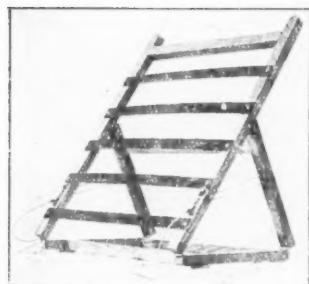
sterilized air. The velocity of the air passing through the apparatus is said to be at the rate of 300 feet per minute. The air is drawn through a tube 1 inch in diameter by the action of the forced steam jet. For disinfecting and medicating the air surrounding a patient the apparatus is likely to be of real service. It is worth noting that the force with which the antiseptic air is driven from the apparatus is such that no effort is required on the part of the patient. When the mouthpiece of the apparatus is placed near the patient the antiseptic or medicated air is inhaled into the lungs without effort.

A RELIABLE TYPEWRITER.

Among the many typewriters now clamouring for popularity, we know of none more trustworthy, inexpensive, and convenient than those supplied by the Blickensderfer Company.¹ The BLICKENSDERFER TYPEWRITER—which is of American manufacture, being made in Stamford, Conn., U.S.A.—has been on the market now for about eighteen years, and there are said to be nearly 150,000 machines in daily use. The machine is known all over the world as the "Blick," and is quite apart from all other typewriters, both in its appearance and in its mechanism. The keynote of its construction is simplicity, there being less than 500 parts in the whole machine, as compared with something like 4,000 in some of the larger and more cumbersome typewriters. Simplicity in a typewriter means strength, and there is probably no machine which will stand such an amount of hard work and knocking about without getting out of order. It is easy to learn, a few hours' practice sufficing to enable anyone of average intelligence to understand the machine and write with it. The "Blick" is a portable typewriter, the No. 5 model weighing only 6½ lb.; but it takes foolscap paper, and accomplishes everything that larger machines will do. The type is interchangeable. A special "medical" type wheel is available. Many medical men use this typewriter, and with a large number the script type is a favourite, being an imitation of handwriting. We believe that this typewriter will be found of service to many literary workers who on grounds of health have to live much in the open-air, or are compelled to travel to far distant health-stations, and yet desire to continue their work. By means of such a typewriter as the "Blick," many literary invalids are enabled to follow their loved tasks under outdoor conditions and with a minimum of fatigue. The upkeep of the machine in use is very low. After personal experience of a "Blick" typewriter, we have no hesitation in commending it to medical practitioners, superintendents of hospitals and sanatoria, and those patients and workers who engage in literary work under conditions which necessitate the employment of a compact and portable instrument.

¹ Full particulars may be obtained on applying to the Blickensderfer Company, Ltd., 9 and 10, Cheapside, London, E.C.

A SELF-ADJUSTABLE BED-REST.



The accompanying illustration indicates the form and chief features of the new "LITRA" BED-REST.¹ The framework is of well-seasoned English pitch-pine, and the supports are of black-stained steel laths. Galvanized wire, mesh or Tonquin canes are supplied if desired. Webbing straps are also provided for holding the pillow in place. The bed-rest is well made, strong, comfortable, easily adjusted, and suited to the requirements of all classes of patients. It will be of real service in hospital and sanatorium work, and

will add much to the comfort of cases treated in their own homes.

PROTECTION FROM FLIES.

It is now fully established that flies may act as carriers of disease. Milk, sugar, and other foods can so be fouled. Protection from flies is thus seen to be a prophylactic measure of the greatest importance. This is now easily accomplished by the employment of the extremely simple, cheap, but effective covers introduced by Messrs. R. Sumner and Co., of Liverpool.² A cover has been made of sufficient size (4 feet by 3 feet) to cover an infant's cot. We commend these ingenious contrivances to the notice of medical practitioners, nurses, and all good housewives.

HYGIENIC TEATS FOR INFANTS' FEEDING-BOTTLES.

There is good reason to believe that tuberculosis and other infections are introduced by means of foul teats and so-called "comforters." Nurses and others responsible for the supply of an uncontaminated milk to infants should be acquainted with the new "AGRIPPA" BAND TEAT and BAND VALVE.³ These are made of the best rubber, rendered tough and rigid in the parts where strength is required, and allowing for sterilization by boiling.

¹ The "Litra" Self-Adjustable Bed-Rest is supplied by the Nurses' Outfitting Association, Ltd., 113, Wellington Road South, Stockport, at prices varying from 12s. 6d. to 15s. 6d.

² Specimens and full particulars will be sent on making application to Messrs. R. Sumner and Co., Ltd., 50A, Lord Street, Liverpool.

³ Specimens and full details may be had from Messrs. J. G. Ingram and Son, India-rubber Works, Hackney Wick, London, N.E.

A TELEPHONE DISINFECTOR.

Undeniable evidence has recently been produced showing that the telephone may be the medium for the conveyance of the organisms of disease. Telephones are commonly used by tuberculous subjects, and there is, therefore, good reasons for welcoming the neat, durable, effective, and inexpensive TELEPHONE DISINFECTOR,¹ which has recently been introduced. By its means antiseptics are conveniently brought into contact with the interior of the mouthpiece. The appliance does not impair the efficiency of the instrument for telephonic communication. Such a simple contrivance might well be fitted to every telephone.

A SLING PILLOW.

Mr. Cairns Forsyth has devised a simple form of support for patients in the semi-recumbent position. The SLING PILLOW² rests beneath the thighs, and is fixed by straps to the top of the bedstead. By propping the body up with pillows or a bed-rest, any suitable angle may be arranged. The sling affords a very effective means for preventing the slipping down of the patient into the bed. It will be of real service in the nursing of many advanced tuberculous cases.

HYGIENIC NOVELTIES.

The "EMPIRE" WINDOW-CLEANER is the invention of Mrs. Wimble, and consists of a band of webbing, to which a cleaning pad is attached. It affords simple but effective means whereby the outside of windows may be cleaned from the inside. Such a contrivance will be of value in many homes.

The PATENT LOOFAH WALL STICK, or Cleaner, is another useful novelty for the house. It consists of two loofah pads on springs, and affords a ready and easy means for cleaning dirty walls without the use of steps, brooms, or brushes.³

A PNEUMATIC SPRAY PRODUCER.

In the cleansing of rooms of dwelling-houses, schools, public halls, and especially wards and other apartments which have been used by tuberculous and other sufferers from contagious diseases, effective means for the distribution of cleansing and disinfecting fluids are most necessary. One of the most reliable and helpful contrivances which we have seen is provided by the INVICTA PNEUMATIC SPRAY PRO-

¹ Supplied by the Telephone Disinfector Company, 55, Hatton Garden, London, E.C. Price 3s. 6d. each.

² Supplied by the Medical Supply Association, 228-230, Gray's Inn Road, London, W.C. Price 8s. 6d., or, complete with two pillow-slips, 12s. 6d.

³ The above novelties are now being supplied at most up-to-date stores—the window-cleaner at 3s. 9d. and 4s. 9d. each, the wall-cleaner at 2s. and 2s. 6d. each. They are manufactured by Messrs. S. Ramsey and Co., 198 and 200, St. John Street, London, E.C.

DUCER.¹ It consists of a well-finished, durable, copper-polished vessel, holding four pints of liquid. It can be held in the hand or attached to a long rod, as the handle is of tubular form. The pump is easily worked, and when pressure has been obtained the spray continues to give a steady, widely-diffused cloud of finely-divided liquid for some minutes. The jet allows of adjustment. The producer is self-contained, pump and all accessories being combined to form one apparatus. After testing this ingenious, easily operated, and most handy appliance, we desire to commend it to the notice of superintendents of sanatoria and hospitals for consumptives, and medical officers of public schools, believing that it will prove of much service in maintaining hygienic conditions essential for such establishments.

ASEPTIC DRINKING-CUPS.

From America we have received specimens of the PURIFORM ASEPTIC PAPER DRINKING-CUP.² Each is enclosed in a sealed envelope, and consists of a parchment-like paper contrivance, which, when opened out, forms a strong, useful, and absolutely clean drinking vessel. For travellers, as well as infectious cases and other patients, these paper cups should be useful.

PROTECTION FOR OPEN-AIR DWELLINGS.

Enthusiasts for open-air methods are in danger of forgetting that dangers and difficulties often attend the pursuit after hygienic righteousness. Invaders, both bird and beast, and, worst of all, human intruders, sometimes find in the open window and the open door means of entrance for illegitimate purposes. Where this danger has arisen or may be suspected we would recommend resort to the ingenious BOSTWICK COLLAPSIBLE GATES AND SHUTTERS.³ These are well adapted for use in hospitals and sanatoria as well as for private dwellings.

MALTED MILK.

HORLICK'S MALTED MILK is a preparation which has stood the test of time and trial.⁴ It is a particularly useful adjunct in the dietetic management of tuberculous cases. Consisting of an extract of selected wheat-flour, barley malt, and pasteurized, full-cream cow's milk, reduced to dryness at a low temperature *in vacuo*, it forms a highly nutritious, easily digested, and most palatable food and drink, not only for the convalescent, delicate, and sick, but also for the hard-pressed business and professional worker. For nursing women and children with tuberculous tendencies, malted milk is invaluable. This nutritious food can now be obtained in the form of "lunch tablets."

¹ Supplied by Messrs. L. Lumley and Co., Ltd., 1, America Square, Minories, London, E.C. Price 22s. 6d.

² Manufactured by the Burnitol Manufacturing Company, Cambridge, Mass., U.S.A.

³ Full particulars may be obtained on application to the Bostwick Gate Company, Ltd., 10, Gray's Inn Road, London, W.C.

⁴ Full particulars may be obtained on application to Malted Milk, Ltd., the manufacturers of Horlick's Malted Milk, at their Mills, Slough, Buckinghamshire.

GLIDINE PREPARATIONS.

Messrs. Menley and James have recently introduced a series of glidine preparations, which promise to be of service in the treatment of tuberculosis and other wasting diseases. GLIDINE is a vegetable, albuminous preparation, derived from wheat-meal by means of a special mechanical process, approved by Dr. Klopfer. It is a fine, yellowish-white powder, without taste or odour, insoluble in water, and having no irritative effect on the stomach of debilitated patients. It is easily digested, and forms a ready means of conveniently providing asthenic cases with nutritious absorbable proteid. Under the names of Iodo-glidine, Bromo-glidine, Ferro-glidine, Arsan, and Luesan, glidine may be obtained organically combined with iodine, bromine, iron, arsenic, and mercury. In these forms convenient and effective means are provided for the administration of some of the most useful elements known to pharmacists. We commend these preparations to the notice of all physicians, and especially to those responsible for the care of tuberculous subjects.¹ They provide just those combinations of nutrients and drugs which experience has shown are often of the greatest value in complicated cases of tuberculous disease.

HYGIENIC TOYS FOR CHILDREN.

Toys undoubtedly not infrequently are carriers of infections. The conscientious doctor and nurse often find the toy question one of considerable perplexity. Now, however, there can be no lack of hygienic books and toys for tuberculous and other children, for, by the ingenuity of Dean's Rag Book Company, a delightful series of books, dolls, toy-sheets, soldier-pinafores, and the like, artistic, amusing, and instructive, are available, and should be known and prescribed by all doctors who desire to do the best for their little charges. These hygienic toys are practically indestructible, the colours are fast, and they may be washed or even sterilized without suffering detriment. We cannot too strongly commend these amusements for the children.²

¹ Full particulars may be obtained on application to Messrs. Menley and James, Ltd., Menley House, Farringdon Road, London, E.C.

² Full particulars on application to Dean's Rag Book Company, 18, Paternoster Square, London, E.C.



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NOTES.

THE QUEEN ALEXANDRA SANATORIUM, DAVOS.

By the opening of the Queen Alexandra Sanatorium at Davos, in the early autumn, an important forward step will be taken in our national sanatorium work.

By the opening of this institution, under the gracious patronage of Her Majesty the Queen, means will be available for the combination of the Alpine climatic treatment with the most perfect sanatorium advantages. This self-supporting sanatorium is to be restricted to British and



THE QUEEN ALEXANDRA SANATORIUM, DAVOS.

American patients of limited means, suffering from early pulmonary tuberculosis. It is impossible to foretell what future developments may be in store for this praiseworthy undertaking; but an inestimable boon is now offered to those who will avail themselves of it at the earliest period of their illness and irrespective of season. An outlay of £10 for the double journey, and of 38s. a week for board and residence (all in separate rooms), and for medical attendance, with a personal washing as the only extra, represents approximately total cost of £35, for a stay of about



DAVOS, FROM THE QUEEN ALEXANDRA SANATORIUM.

three months, or of £50 for a stay of about five months. All the details concerning the journey, outfit, etc., and the procedure to be followed by applicants for admission, can be obtained on application to the Secretary, the Queen Alexandra Sanatorium, Davos Platz, Switzerland. In England copies of the forms may be obtained from the Honorary Secretaries, Wm. Ewart, M.D., 31, Upper Brook Street, London, W.; and D. Vesey, Esq., 3, Camp View, Wimbledon Common, S.W.

GERMAN "FÜRSORGE-STELLEN" AND CONSUMPTIVES.¹

In Germany the curative and educational work of sanatoria is splendidly supplemented by the important work of the "Enquiry and Care Stations for the Tuberculous" [Dispensaires Anti-tuberculeux]. These do very successful work in the absence of compulsory notification of tuberculosis. There are 117 such care-stations [1907], and they are often linked to hospitals. Thirty-one are under the Poor Law. The dispensary medical assistants hold consultations in the dispensary, where they interview the relatives of persons suffering from pulmonary tuberculosis, and in some cases the patients themselves. Information is given regarding practicable measures for the relief of the suffering patients, suitable diets, disinfection, prophylaxis against the domestic spread of infection, and so forth. Special dispensary sisters make repeated visits to the stricken families in order to assure themselves that the instructions are being carried out. Domiciliary conditions are specially noted. Where the prevailing circumstances render such a course urgently desirable, an extra room is hired out of the Poor Law funds in order to isolate the patient, and in some cases a single bed with bedding is lent to the patient to enable him to sleep alone. The care-station doctor is in touch with children's sanatoria, seaside homes, etc., and can arrange to send children threatened with tuberculosis to these places. The campaign against tuberculosis in the country districts presents special difficulties, but recently the country Medical Officers of Health have found it practicable to utilize the services of country midwives and district nurses. Their intimacy with the domiciliary conditions of their patients makes them peculiarly fitted to act as influential preventive factors against the spread of the disease. Ambulatory dispensaries have also been started.

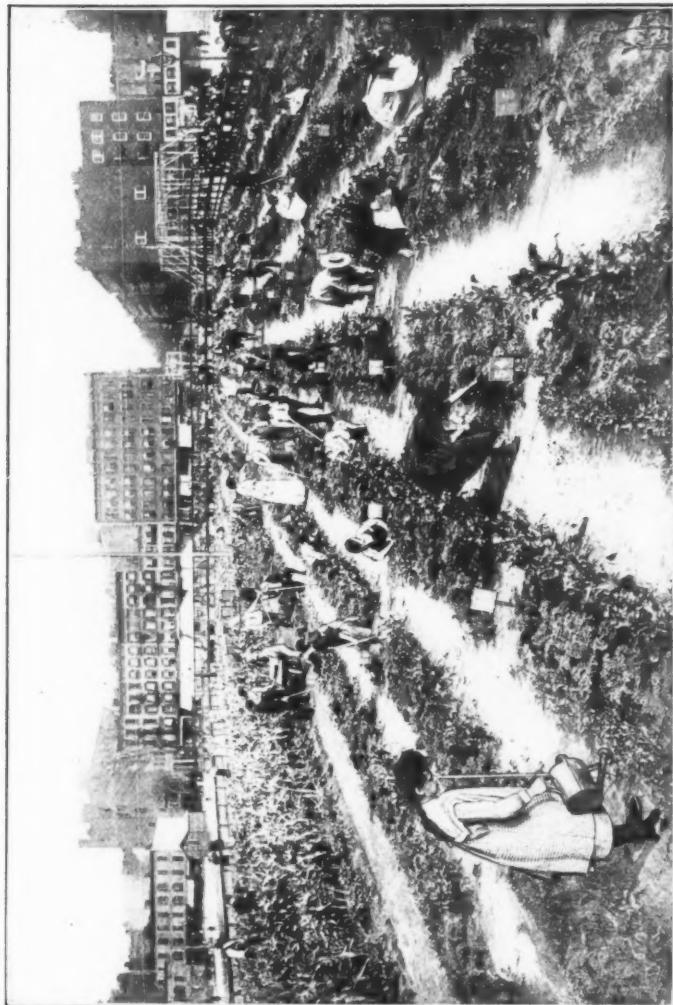
CITY GARDENS FOR CHILDREN.

In our last issue we devoted special attention to Open-air Schools for tuberculous and tuberculously disposed children. We now desire to commend to all interested in the protection of child-life the very admirable "Children's Garden Movement," which is being carried on in New York City and elsewhere in the United States of America by the International Children's School Farm League.² A garden pro-

¹ We are indebted to Mrs. Emilia V. de Voss for the interesting and suggestive information contained in this note.—EDITOR B.J.T.

² For the loan of block from which the accompanying illustration has been prepared we are indebted to the courtesy of Mr. Henry Griscom Parsons, the Secretary of the

vides children with outdoor work and open-air play, and such an institution should exist in connection with every school and sanatorium

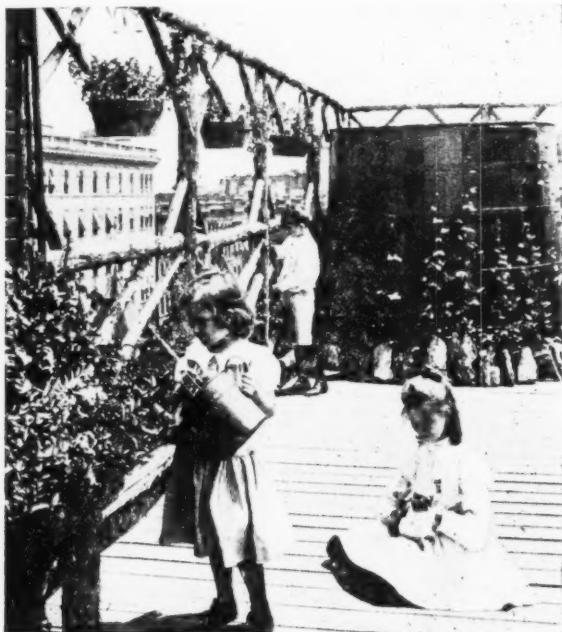


A CHILDREN'S CITY GARDEN.

for young subjects. For cripples, consumptives, and other physically defective patients, as well as for many mentally enfeebled cases, a

International Children's School Farm League, 20, West Fifty-sixth Street, New York City, from whom full particulars of the Children's Garden Movement may be obtained.—EDITOR *B.J.T.*

garden affords restful and restorative influences, the value of which can hardly be overestimated. As the accompanying illustration shows, even unpromising vacant urban plots may be made to bud and blossom. All friends of children may well unite in popularizing this movement everywhere.



CHILDREN AT PLAY IN THE ROOF GARDEN OF A PRIVATE HOUSE IN NEW YORK CITY.¹

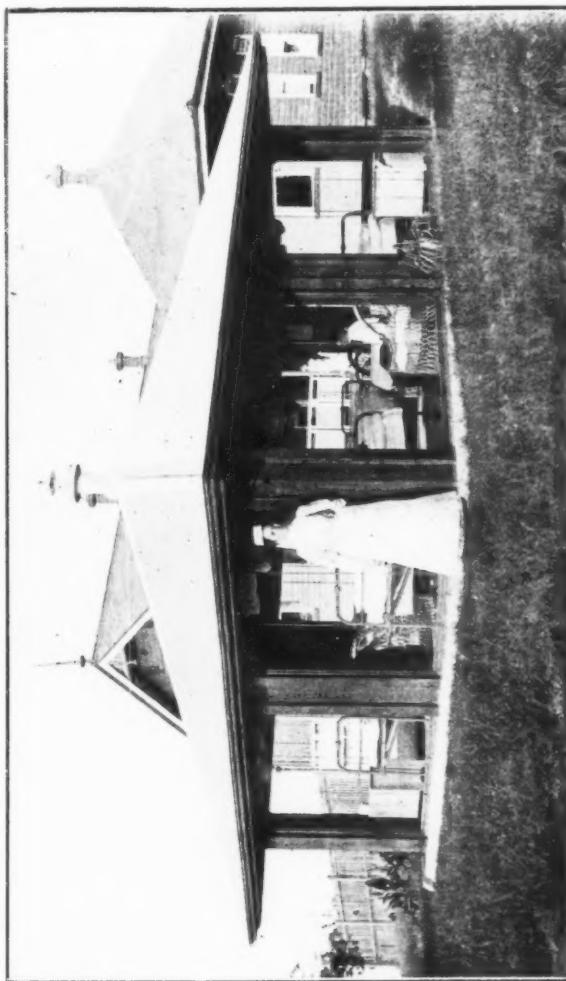
In crowded cities much may be done to secure an open-air life for the children by arranging for roof-gardens to private dwellings. The benefit of such is graphically illustrated in the accompanying illustration.

OPEN-AIR WARDS FOR CONSUMPTIVES.

Much ingenuity has been displayed in the construction of structures in which tuberculous patients could undergo open-air treatment with the minimum of discomfort and the maximum of benefit. Dr. Francis Hare, late Inspector of Hospitals for Queensland, has kindly furnished

¹ We are indebted to the courtesy of Professor S. A. Knopf and his publishers, Messrs. Moffat, Yard and Company, for permission to reproduce this suggestive illustration from "Tuberculosis: A Preventable and Curable Disease."—EDITOR *B.J.T.*

us with the accompanying illustration of a permanent tent or open-air ward, which he introduced at the Diamantina Hospital for Chronic Diseases, Brisbane. The ward contains four beds, and is extremely



OPEN-AIR WARD AT THE DIAMANTINA HOSPITAL, BRISBANE.

simple in its construction. It consists of : (1) Concrete floor, drained ; (2) broad hard wood uprights ; (3) canvas blinds on spring rollers ; (4) galvanized iron roof, not lined, but ventilated centrally and painted outside with refrigerating paint. The cost was about £80. In warm calm weather all the blinds are raised as in the photograph, both day

and night ; with strong winds, the blinds are lowered on the weather side only. The tent shown was the first erected ; it is some eight or nine years old. There is now a series. The principle has been adopted by the Brisbane General Hospital, where similar tents are used for septic surgical and other cases.

THE PRESS AND THE ANTI-TUBERCULOSIS CAMPAIGN.

The power of the Press is practically limitless, but hitherto very imperfect use has been made of it as a popular medium for the education of the public in matters relating to the arrest of the Great White Plague. As far as the United States of America is concerned, all this is to be rectified. The National Association for the Study and Prevention of Tuberculosis (105, East Twenty-second Street, New York City) have organized a Press Service. The bulletins which have already reached us are excellent. Dr. Livingston Farrand, the executive secretary, and Dr. Phil. P. Jacobs, his assistant secretary, have undertaken a work which is likely to accomplish more for the rational conduct of the campaign against tuberculosis than any other form of effort yet brought to bear on this world-wide scourge. We trust journalists everywhere will make themselves acquainted with this admirable Press service.

TUBERCULOSIS EXHIBITS.

Tuberculosis exhibitions have provided popular as well as instructive means for the combat of the Great White Plague. In Ireland, Canada, the United States of America, and elsewhere, they have accomplished much. The collection of the National Association for the Prevention of Consumption and other Forms of Tuberculosis, first in Whitechapel and recently at the Imperial International Exhibition at Shepherd's Bush, has proved of real service in educating the people. But something more than a merely ephemeral demonstration is necessary. Untold good would be attained if a permanent display of Anti-Tuberculosis work could be arranged in a prominent shop-window in the leading street of every large town. This is an educational experiment which has been successfully tried in Stockholm. It offers an attractive means of affording instruction to all classes of the community. With the minimum of expense the maximum of hygienic benefit may be obtained. We strongly commend the Anti-Tuberculosis Shop-Window to Municipal Health Authorities, and to all societies working for the elimination of tuberculosis by the education of the public.





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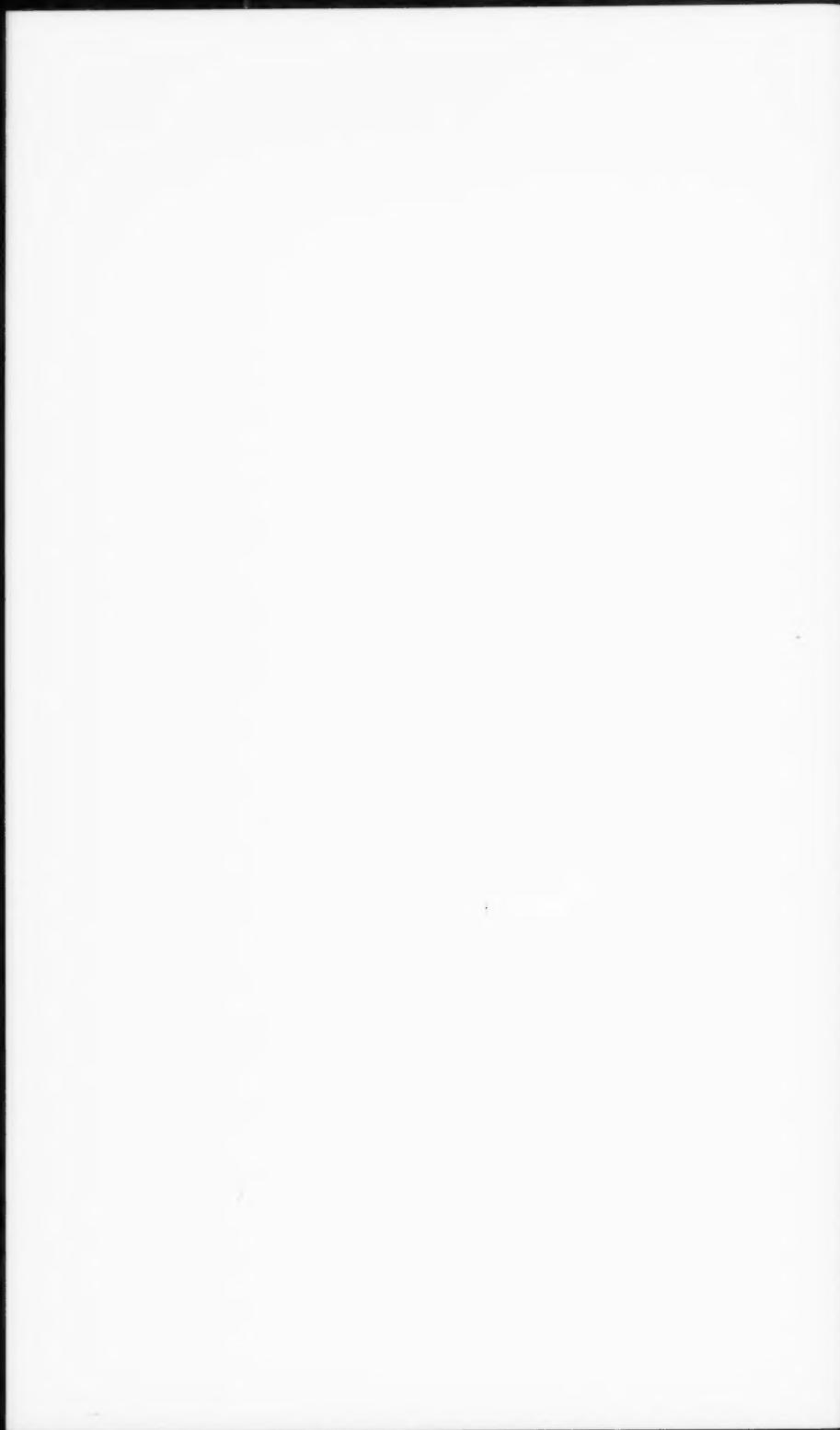
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